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THE UNIVERSITY OF ALBERTA

INSERVICE EDUCATION FOR TEACHERS OF THE SEVERELY AND PROFOUNDLY HANDICAPPED

©

by

DONNA S. BARRETT

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
AND RESEARCH IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF EDUCATION
IN
SPECIAL EDUCATION

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA
SPRING, 1987

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PERMANENT ADDRESS:

9824-188 St

Edmonton Alta

DATED April 21 1987

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled THE EFFECTS OF INSERVICE EDUCATION ON TEACHERS OF SEVERELY AND PROFOUNDLY HANDICAPPED CHILDREN submitted by DONNA SHIRLEY BARRETT in partial fulfillment of the requirements for the degree of Master of Education.

Gerard M Kysela
Supervisor

....

Richd S
David G Wangler

DATED Feb. 12 19 87

ABSTRACT

This study investigated the effects of the Systematic Training for Educational Programming Inservice on the instructional practices of four teachers of students with severe handicaps. Several of the many objectives of the inservice were selected as variables in the present investigation. Repeated observations of the behavior of students and staff were conducted in order to measure the impact of the training program. A multiple baseline design across subjects was used to evaluate the treatment effects.

The first set of variables were related to the intensity of instruction. The analysis of the observational data collected over the thirty-one week period indicated mixed results. All subjects showed slight increases in student involvement in activities. None showed an increase in the percent of direct instruction. Two of the four subjects under investigation demonstrated an increase in the use of formal written instruction and data collection.

The second component of the study focused on the functionality of instructional content. All subjects demonstrated an increase in student involvement in functional activites, indicating a shift to more functional educational content. Two of the subjects showed an increase in the use of activities which were age-appropriate following treatment. Other desirable characteristics of functional content such as the use of functional materials and the presentation of activities within a meaningful context were found to be present at high levels for all subjects during baseline.

The third component of the study investigated location of instruction. Analysis of the observational data indicated no change as a result of participation in the training program.

The final component of the study investigated whether or not there was an increase in the instructional intensity of activities which were defined as functional. The visual analysis of the treatment effects indicated that there was considerable variability in the individual responses across subjects. The first two subjects demonstrated positive effects as a result of treatment while the other subjects showed little change following the inservice.

Explanatory hyotheses concerning the results are presented. Also, based on the results, changes in the format of inservice delivery to enhance its effectiveness are also suggested.

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Chapter I

INTRODUCTION

The Problem

In the United States, Public Law 94-142 granted persons with severe handicaps the right to a publicly funded quality education in the least restrictive environment. In Canada, while this right has not been legally mandated across all provinces, there has been a growing tendency for local school districts to assume responsibility for the education of these students. The demand for an appropriate public education has been accompanied by a period of increased investigation to identify curricula and methods of instruction which maximize learning.

Perske and Smith (1977) suggested that teachers of person's with severe handicaps require specialized training in order to enable these students to achieve their true potential. The rapid growth and change in educational programs serving the severely handicapped has resulted in a situation where there exists wide descrepency between the roles which school staff have been trained to fill and the roles with which they are now confronted (Madle 1982). Lower rates of teacher attrition have made reliance on preservice training to adequately prepare necesary staff for teaching positions clearly insufficient (Browder, 1983) . As a result, there is a critical need for systematic, comprehensive inservice training which would train staff in the specfic skills necessary to implement a curriculum which would effectively prepare severely handcapped persons with the skills they require to function as independently as possible in a variety of integrated natural environments.

Statement of the Problem

This study sought to investigate the impact of the Systematic Training for Educational Programming (S.T.E.P.) Inservice on teaching content and intensity of instruction in several classrooms serving students who are severely handicapped. Based on a review of the literature, the training in the Teaching Research Data Based Model (Fredericks, Baldwin, Moore, Peterson, Piazza Templeman, Toews, Stremell-Campbell, Bunse, Makohon, Wilson, Aschbacher, Trecker, Maude, & Samples, 1982) modified by staff employed by the Edmonton Public School District to reflect currently recommended practices for program content, selection, and implementation. Repeated observations on the type and intensity level of student involvement in activities were conducted in order to evaluate the impact of the training program both on staff and child behavior.

Scope and Limitations of the Study

Four classroom teachers of students with severe handicaps agreed to serve as subjects in this investigation.

All of the teachers participated in the S.T.E.P Inservice. Teachers A and B received the training during different sessions prior to Christmas break while Subjects C and D were trained together in February.

Two of the participating teachers taught in programs within the Edmonton Public School District and two were employed by the Edmonton Separate School District. Each program was staffed by one certificated teacher as well as teaching assistants. Three of the four teachers had training in special education and one of these three had a masters degree in special education. The staff student ratios in the classrooms ranged from 1/1.7 to 1/2.8. The children who attended these programs ranged in age from four to eighteen years of age. In addition to developmental delay, these children exhibited a wide variety of handicapping conditions including motoric disabilities, sensory impairments, and/or behavior disorders.

The investigation took place over a 31 week period during which observations were conducted on approximately a weekly to biweekly frequency commencing for each subject about 4 weeks prior to participation in the S.T.E.P. Inservice. Classroom observations consisted of a series of thirty second observations on each of the students in the classroom in sequence. These checks occurred at ten minute intervals covering a period of two and a half to three hours for each visit. A multiple-baseline across subjects design was used to evaluate the effects of the treatment.

The lack of control over certain extraneous variables which is inherent in naturalistic, applied research places some limitations on the degree of confidence with which inferences concerning treatment effects can be made. In particular, the use of observational methodology can pose a significant threat to the internal validity of this investigation, through such confounding factors as observer bias, observer drift, or the reactivity of the measurement process. However, as will be discussed in Chapter Four, caution was exercised in the design and the use of the observational methodology, in order to minimize the confounding effects of these factors.

In order to improve the generalizability of the results, the treatment effects were replicated over four subjects who came from a variety of educational settings serving children of differing ages and ability levels. However, the heterogeneity of the subjects, settings and students makes the interpretation of differential outcomes very difficult. As a result, it is not possible to conclusively identify specific variables which may account for the differential treatment effects seen across subjects. Thus, this study does allow for the estimation of the generality of the treatment effects across subjects. It will. as well, suggest future plausible avenues of research investigating additional variables which may account for treatment effects seen.

Chapter II

SELECTIVE REVIEW OF THE LITERATURE

The term, severely handicapped, has included persons who have been labelled trainably mentally retarded, severely and profoundly multiply handicapped, autistic, deaf/blind, or severely emotionally disturbed (Favley, 1986). These persons have evidenced significant delays in development relative to their nonhandicapped peers. In the area of self-care skills, many of these children are only partially toilet trained or not toilet trained at all. They generally have required some level of assistance to feed themselves and to perform basic hygenic activities such as washing.In the area of social development, persons with severe disabilities have often engaged in bizarre or inappropriate actions such as avoiding eye contact, or stereotypic behavior that in some cases is self-injurious. Their language skills are delayed. Frequently the persons have required the use of alternative means such as sign language or picture boards to enable them to communicate since many are not able to communicate orally. Their learning difficulties are often compounded by other disabilities such as physical handicaps, sensory loss, or medical conditions. Sailor and Guess (1983) have indicated that the common thread that brings these groups together is their degree of dependence on others.

Orientations to Curriculum Content For the Severely Handicapped

Historically, severely retarded individuals, were viewed as incapable of learning (Wolfensberger, 1969). As a result, an instructional curriculum appeared inappropriate for this population (Brinker, 1985). In spite of these beliefs some educational efforts were made (Buck, 1930; Hunt, 1967; Keller, 1955; Killilea, 1962). Donder and York(1984) note that some of these early attempts achieved extraordinary success despite the fact that they were characterized by poor facilities and untrained staff. These successes led to increased pressure to develop curriculum content for these individuals.

Wilcox & Bellamy (1982) stated that both professional writing and published curriculum materials for severely handicapped students suggested that there were three major orientations to defining curriculum: applications of operant theory, developmental models, and the functional approach.

Application of Operant Theory

The application of behavioral analysis measurement techniques and research technology to handicapped persons grew out of well documented experiments with laboratory animals (Snell, 1978). The results of early investigations on the application of operant principles to children (Azrin & Lindsley, 1961; Bijou, 1958; Bijou & Orlando, 1961) led a concept of retardation as an interaction between the person and his environment which could either support or limit the capabilities of the individual (Hobbs,1966; Cantrell & Cantrell, 1976; Filler, Robinson.Smith, Vincent-Smith, Bricker & Bricker, 1975). An individual's behavior was viewed as a function of his history (Skinner,1953) that could be changed by altering antecedents and consequences of that behavior.

> The emergence of a behaviorist conception of man as a machine, largely programmed by the environment, introduced the possibility of curriculum for even the most severely retarded people"(Brinker, 1985, p. 60)

This perception was supported by research demonstrating that this technology could effectively change even the most problematic self-injurious and self-stimulatory behaviors.

The eliminative approach to selecting instructional content utilized extensively the technology of applied behavior analysis. It focused on the need to eliminate behaviors that appeared to be maladaptive, inappropriate, or interfering with learning prior to targetting new adaptive responses for instruction. The prevelence of this approach can be inferred from an examination of the experimental literature concerning persons with severe handicaps. The bulk of this work has targetted reductions in inappropriate behaviors as opposed to research on building competency (Berkson & Landesman-Dwyer, 1977). Barrett (1979) and

Gardner(1971) suggested that the danger of the eliminative approach to selecting instructional objectives was that it could result in the severely handicapped student being stripped of his only means of controlling his environment. In addition this approach further delayed instruction in adaptive skills.

Skinner (1938) stated that operant behavior was best defined by its function rather than its form. Traditionally many of the approaches to eliminating inappropriate behavior did not address this issue. The focus was to eliminate the presence of the behavior. Recent work by Donnellan and Miranda(1985) has demonstrated success in eliminating inappropriate behavior by teaching the individual to utilize an acceptable alternate behavior to achieve the same function. Their approach focused directly on attempting to determine the function of the maladaptive behavior and selecting a treatment program that would permit the individual to achieve his goal by more appropriate means.

Bricker (1970) noted that many of the early successes of the application of operant techniques to retarded persons residing in institutions involved increasing or decreasing the frequency of behaviors which were already in the student's repetoire. It later became apparent as people began working with young severely retarded students who had never lived in residential institutions that their primary educational problem was limited behavioral repetoires rather than the presence of aberrant behavior.

In a series of articles on applications of the principles of analysis of behavior as applied to the classroom, Lovitt (1968, 1970, 1975, 1976, 1977) identified the characteristics of the approach as direct measurement, daily measurement, replicable teaching procedures, and individual analysis. He emphasized that good instruction required systematic application of programs in a consistent manner accompanied by continual evaluation through daily monitoring of student performance. There has remained a general acceptance of these instructional principles today although changes have occurred in content selection and organization for instruction.

By the mid 70's there had been demonstrations of the successful application of the principles of applied behavior analysis to many major instructional areas of concern to teachers of the severely handicapped (Snell, 1978). Children with no language were taught to use some words appropriately. Success was demonstrated establishing toilet training, teaching appropriate eating skills, and independent dressing.

Guess and Helmstetter (1986) noted that while application of the principles of applied behavior analysis offered great promise for improving the quality of instruction, some educational programs succumbed to the temptation to borrow more than the learning principles from the animal researchers. The educational goals for learners were sometimes extrapolated from laboratory research studies(e.g., imitation training that stressed nonfunctional body movements or even various academic tasks such as matching colors or placing rings on pegs). More functional skills such as communication, self-help, or vocational tasks were performed out of context, in ways that expedited the application of the instructional procedures, and almost always required the use of artificial reinforcers to both establish and maintain learning. Instruction in classrooms followed a similar format that emphasized one-to-one instruction, massed trials, and programmed consequences often consisting of small bits of candy, sips of juice, or other salient foods. The settings for instruction were often purposefully kept barren in order to remove 'distracting stimuli.'

Application of Developmental Psychology to Curriculum for the Severely Handicapped

The developmental model relied on normal child development as a referent for curriculum selection (Wilcox & Bellamy, 1982). This approach specified a definite sequence of curriculum content as the basis for selecting instructional objectives (Sailor & Guess, 1983). The underlying assumption was that the severely handicapped student followed the same developmental sequence as the nonhandicapped persons. This approach also incorporated the concept of readiness which assumed that a person could not master a skill within a content area until all of the prerequisite skills were mastered.

Curricula developed on this basis such as the Teaching Research Curriculum for the Moderately and Severely Handicapped (Fredericks et al., 1980) were organized into the following content areas: gross and fine motor skills, language/communication, social skills, self-help and cognition. Within each curricular domain, instructional activities were sequenced in the order in which these skills were generally acquired by nonhandicapped children.

Curricula based on the developmental model frequently incorporated the instructional procedures utilized by behaviorists. Programs utilized systematic behavioral procedures such as task analysis, a system of cues and consequences, specified reinforcement procedures, and regular data collection which served as the basis for program modification.

The developmental model had the advantage of providing teachers of the severely handicapped with a clear sense of direction in the selection of instructional content. It gave teachers some means of feedback that their students were progressing as a result of their instructional efforts. Assessment of student progress was relatively simple as the developmental sequence served as the basis for both the assessment and the selection of instructional content (Wilcox & Bellamy, 1982).

The appropriateness of the developmental model was dependent in part on the student's age. Wilcox (1979) and Williams and Gotts (1977) noted that the developmental model of curriculum had some definite advantages for selecting programs for severely handicapped students particularly with infants and preschoolers. However, even for this age group, it could not be the total basis on which to select instructional content. A complete educational program needed to include procedures to reduce undesirable behavior (Bricker, Iacino, & Dennison, 1976) and to teach directly skills such as imitation that were critical for learning more advanced skills (Hayden, McGinnes, & Dmitriev, 1976). Wilcox and Bellamy (1982) stated that the use of "developmental milestones" as a method of curriculum selection for severely handicapped adolescents was inappropriate.

The developmental approach had disadvantages similar to the operant approach. This was partly due to the fact that apart from curriculum selection many of the instructional design procedures were borrowed from the operant model. Skills were typically taught in isolation out of their natural context. This resulted in the acquisition of a series of splinter skills that might be of little immediate or long term value to these individuals (Williams & Fox, 1977; York & Williams, 1977). This practice reduced the likelihood of generalization and transfer of skills to situations in which they were typically required. Some objectives were selected directly from infant assessment devices that had limited functional utility. Also there was generally a failure to provide adapted objectives for individuals, such as the physically handicapped student, who did not have normal capabilities. Finally the model failed to take into account the slow rates of skill acquisition which logically precluded the possibility of severely handicapped children being able to be involved in age-appropriate activities as they matured (Wilcox & Bellamy, 1982).

Functional Approach

A combination of factors brought about the shift toward a functional orientation to educational program content for persons with severe handicaps. Generally all education, whether for students with special needs or the regular child has served to prepare its students for their role as adults in whatever society they are to enter. It was in part a focus on the future role of the severely handicapped person in society that spawned the functional approach to teaching persons with severe handicaps. One major influence that clarified the role of persons with handicaps was the philosophy of Normalization (Wolfensberger, 1969). The philosophy of Normalization suggested that persons with disabilities should experience patterns of daily activity that were as close as possible to a normal rhythm of life. Nirje (1980) operationally defined the 'quality of life' of a disabled person by this standard.

This orientation took on the weight of a legal mandate with the passing of Pl 94-142 whose intent was to ensure that disabled persons had access to a free and appropriate publicly funded education in the least restrictive environment. This act shifted the responsibility for development and implementation of educational programs to the local school districts. In addition, the act mandated that handicapped children should be educated to the maximum extent possible with children who were not handicapped (Sailor & Guess, 1983). These requirements undoubtly shifted the orientation of those who were in positions to develop curriculum toward instruction of skills that would be required in integrated environments.

A third influence that supported the shift toward more functional content was the lack of success of other approaches in enabling students to acquire the skills necessary in order to have access to a normal pattern of life experiences. Both the operant and the developmental approaches had been responsible for significant improvements in instructional content and practices for severely handicapped students. However, used as the sole means for selecting and implementing programming, each fell short of the goal of allowing the student to gain skills sufficient to function successfully in a wide range of integrated environments.

This descrepency was recognized by McCormack and Audette (1977) who indicated that appropriate services for persons with severe disabilities ought to extend beyond the artificial limitations imposed by traditional education to a concept of total planning which considered the critical relationship between education and other life activities. They suggested that the emphasis of educational activities should be to help the learner cope with the out of school environment.

Presently a general focus for education of this population is to provide instruction which will allow each individual to become as independent as possible in multiple environments which are presently available or are potentially available in the future. Falvey(1986) stated that curricula for this student population must be "functional, chronological-age appropriate and reflect transitions"(p. 4). Educational experts have developed in recent years a generic set of "best practices" that provide a framework for both content selection and program implementation within this orientation. In order to achieve this end each student required a unique educational program which took into account the individual's strengths, needs, and instructional requirements, as well as the demands of present and future environments.

Functional Activities.

Functional content referred to a program of studies that facilitated the development of the skills which would allow the individual to participate in a variety of integrated environments. Brown, Branston, Hamre-Nietupski, Pumpian, Certo, & Gruenewald(1979) suggested that teachers determine whether an activity was functional by asking themselves the following question:If the student did not learn to perform a specific activity would someone else have to perform it for him? Like curricula for all students, programs for severely handicapped students were to be directed toward the future. Favley(1986) referred to the transition aspect of curriculum selection as preparing the student for subsequent ~~environments~~, norms, and rules. This standard for selecting curriculum content was identified as the criterion of ultimate functioning (Brown, Nietupski, & Hamre- Nietupski, 1976) or next environment strategy (Wilcox and Bellamy, 1982). Curriculum content was to be drawn from activities that occur in the school, home, community , and vocational/ environmental domains (Brown et al,1976; Guess & Sailor, 1983).

Age-appropriate Activities.

As previously noted educational curriculum content was also to be chronologically age-approporiate. This criterion referred to the fact that students, regardless of their disability or developmental level, were to be involved in and taught activities in which one would expect to find a nonhandicapped age peer to be engaged. This guideline also implied that interactions with students should reflect their chronological age. For example, toiletting arrangements for adolescents should reflect a teenagers needs for privacy.

The rationale for this approach was that age-appropriate content would facilitate opportunities for interaction with non-handicapped age peers by increasing the likelihood of contact. In addition, it was felt that nonhandicapped persons would have a more positive attitude towards an individual who was engaged in age-appropriate activities. Recent research has provided support for this hypothesis. Bates, Morrow, Pancsofar, and Sedlak (1984) found that college students who observed slides of persons with severe handicaps involved in functional integrated and age-appropriate tasks felt they had higher IQs, better future earning capacity,and were more mature than persons involved in nonfuncional activities. In addition the observers suggested the appropriateness of less restrictive living and school options for those observed in age-appropriate activities.

Brinker (1985) stated that the ecological or functional model showed the best promise as a framework for curriculum development. The functional approach is now recommended as the dominant guideline among educators for selecting program content and evaluating the appropriateness of instruction for severely handicapped students (Sailor & Guess, 1983; Snell, 1983; Wilcox & Bellamy, 1982). When identifying the characteristics of quality programming Bates, Renzaglia, and Wehman (1981) indicated that age-appropriate curricula and materials should be used to teach skills that are defined as functional by virtue of the fact that they are of immediate usefulness to students by virtue of the fact that they allow him/her to interact more meaningfully with his/her environment; have long term validity in terms of their appropriateness for community living or are entry skills for less restrictive educatonal environments.

Issues in the Selection of Functional Curriculum Content

Selection of appropriate content for instruction has been an important component of educational programs because of its direct relationship to the quality and utility of the program. Selection of appropriate curricula has been particularly important for persons with severe disabilities because of their slow rate of learning. Brown, Nisbet, Ford, Sweet, Shiraga, York, & Loomis (1983) suggested that the severely handicapped acquire, over their school career, a much smaller set of skills than approximately 99% of their chronological age peers. Also, their well documented difficulty in generalizing acquired skills (Sailor & Guess, 1983) and the complexity of program development adds to the importance of maximizing the utility of curriculum content. While the functional approach has suggested a general focus for selection of educational content, a unique educational program which takes into account individual strengths and weaknesses as well as the demands of present and future environments is required by each student.

Guidelines for Determining Functional Content

Brown, Branston, Hamre-Nietupski, Pumpian,Certo, and Gruenewald (1979) set out a strategy for identifying functional curriculum for adolescents and young adults. This strategy, called an ecological inventory, involved deliniating domains or areas in which a curriculum could be organized . Wilcox & Bellamy (1982) suggested the following curricular areas: domestic, community, school, and vocational. Within each area current and future natural environments were to be identified. The environments were divided into subenvironments, a list of activities performed in each subenvironment was developed, and the skills required in each activity were identified. Snell and Browder (1986) noted that while this was an enormous task initially, once completed it required only biannual updating. This strategy has been incorporated into published curriculum models such as the L.I.F.E. Curriculum (1985). This approach has also been modified slightly so that it is appropriate for use with younger students. For these children the focus has been to train skills which will be important in their next least restrictive environment (Sailor & Guess, 1983). Thus, pre-school children would need to learn skills that would assist them to function more independently in public school environments.

Sailor and Guess (1983) suggested a variation of this approach that involved the creation of a priority matrix to select appropriate curriculum content. Based on the work of White (1980) they identified 'critical functions'(p 107) defined as behaviors of immediate and critical importance to the student's success in becoming more independent in a number of environments. Sailor and Guess (1983) identified critical functions as falling within the following curriculum content areas: eating, toiletting, mobility, expressive/receptive communication, hygiene/appearance, recreation/leisure, and horizontal social interactions. The latter term refers to the importance of programming for interaction between age peers including non-handicapped peers. They suggested that a balanced curriculum should contain instruction in these areas.Selection of specific targets was to be based on the results of the ecological inventory.

The Role of the Teacher

The responsibility for specific instructional content for individual students has rested with the teacher (Ferguson, 1985). At this level individual teacher beliefs about the capabilities of their students and the options open to them were likely to affect the selection of instructional content. This, in fact, was a necessity if curriculum content was to be in the truest sense functional. Brinker (1985) noted that there was an almost infinite variety to potential environments. Objectives that were functional in the environments available to one student might not be functional to a student living in another area. For this reason, it was important that published curriculum materials be used with discretion, ensuring that each selected skill was functional for the particular student taking into account the individual's strengths, needs and the requirements of present and future environments. A cookbook approach to curriculum would not be appropriate .

Snell and Browder (1986) pointed out the need for empirical validation of the present procedures for determining functional content within a given environment. Since the primary method for selecting environments in which the severely handicapped person may participate was common sense (Brinker, 1985), the selection of content was subject to teacher bias. Ferguson (1985) found despite pervasive talk about individualization, teachers catagorized students into groups in ways that were not systematic or even intentional and that decisions about curriculum content were based on these groupings. She found as well that individual teachers varied in what they saw as possible future environments for students within the same catagory (Ferguson,1985). Thus what was functional content for a particular student was to some extent a subjective judgement. As a result it was necessary for teachers to be aware of developments in the field and to be constantly challenging themselves as to whether their beliefs about their students limited the scope of their instruction.

Need For Parent Input

Since many of the most critical functional skills occur naturally outside the school, it has been necessary for teachers to have a process for accessing information concerning instructional priorities in these areas. PL 94-142 legally gave parents the right to have direct input into the content of their child's educational program. Sailor and Guess (1983) suggested parent interviews as one means of input. The L.I.F.E. (1985) curriculum, for example, contained a detailed questionaire to be sent to parents to gather information regarding activities that occur outside the school environment.

Input From Other Specialists

Frequently it has been necessary to have the input of a variety of specialists such as speech therapists, occupational therapists, physical therapists, audiologists, and psychologists to select instructional goals and develop content. In order to co-ordinate input from these individuals into a coherent program a number of authors have recommended the use of a transdisciplinary approach to curriculum development and implementation (Sailor & Guess, 1983; Lyon & Lyon, 1980; McCormick & Goldman, 1979). Lyon & Lyon (1980) identified the three characteristics of the model as being team effort, staff development , and role release. In this process there was to be a pooling and sharing of information, knowledge, and skills which crossed traditional specialist boundaries (Haynes, Patterson, D'Wolfe, Hutchison, Lowry, Schilling, & Siepp, 1976).

The transdisciplinary model placed extensive demands on the classroom teacher. The teacher was responsible arranging and organizing the input from the various disciplines including parents who were considered a part of the team. In addition, the teacher was responsible for ensuring that this information was translated into a treatment program for each child in areas where instruction was required (Sailor & Guess, 1983). Bricker and Campbell (1980) criticized the realism of this approach noting that the average teacher had neither the time nor the expertise to fulfill these roles and that the expectation teachers do so underestimated the complexities of effective interdisciplinary programming. They suggested the need for ongoing input from the different disciplines throughout the program development process.

Recently some procedures have been developed to assist teachers in their function as co-ordinators of transdisciplinary educational teams. Some curricular materials provide format that can be used to gather and organize information from parents and group home staff in order to ascertain areas in which a student requires instruction. Happ and Donofrio (1983) presented a model to organize specialized assessments that would facilitate the development of cross-referenced objectives that encompass learning needs from several related areas of instruction.

Role of the IEP

The IEP process was developed to provide a way to ensure the development of appropriate educational content for students with special needs. Recognition of the importance of the IEP as a vehicle for priorizing led educators to develop checklists to assist teachers to evaluate and priorize goals and objectives from the perspective of functional utility (Evans, Voeltz, & Hanashiro, 1981).

There are indications that the degree to which the IEP serves its function leaves considerable room for improvement. Morgan and Rhode's (1983) study of teacher attitudes toward IEPs found that teachers felt that IEPs helped them organize their time but that they could teach just as effectively and that children would learn just as much without them. The results of this study concur with others (Safer, Morrisey, Kaufman, & Lewis, 1978; Marver & David, 1978; Nadler & Shore, 1980) in concluding that special education teachers tend to view IEPs more as an administrative or clerical task than an instructional task.

In the United States, as a result of PL 94-142 parents were granted the legal right to participate on an equal basis with educators in the development of their child's educational program (Soffer, 1982). Since many of the skills that are ultimately functional for students with severe handicaps occur naturally in environments outside the school, parent input into selection of educational content is essential. Despite the importance of parent input, a numbers of studies have shown that few parents participated on an equal level with educators (Gilliam, 1979; Hoff, Fenton, Yoshida & Kaufman,1978; Marver & David, 1978). Not only did this situation reduce an important information source for curriculum selection but it also decreased the likelihood of having elements of the child's education program carried out at home (Soffer, 1982).

The foregoing discussion indicates that while mechanisms have been in place to facilitate the development of appropriate and functional content, they were, at least in some cases, not being used as intended. As a result there has been some question as to the quality ofthe program content developed.

Issues in the Implementation of a Functional Curriculum

In addition to a shift in curriculum content, the implementation of a functional curriculum model has required some major changes in the manner in which teachers organize for and present instruction. A discussion of these related issues in implementation follows.

Clustering Instructional Objectives

In addition to a change in program content, the shift toward an educational program whose goal was to prepare a student to participate in multiple intergrated environments resulted in a change in the basic unit of instruction. In traditionally organized curricula the individual skill from the developmental sequence was the basic unit and programs were organized to directly teach to the objective specified. For example, when the goal was to teach the student to label objects, instruction was delivered by means of massed practice on a particular skill and usually took place outside the context in which the activity naturally occurred. Within the context of the functional model the basic unit of instruction is an activity that occurs naturally in the child's environment.

In an effort to accomodate this orientation and present material in a more natural manner, Sailor and Guess (1983) developed an alternate model called the "individualized curriculum sequencing approach"(p. 34). The "individualized curriculum sequencing approach" included both distributed trial presentations and concurrent task sequencing (Guess & Helmstater, 1986).In this model practice trials on a particular skill were distributed across several functional activities. If, for example, the child was being taught to label objects, he may have completed several trials within the context of a dressing activity, several more at snack time and so on. The term, concurrent task sequencing referred to the procedure of teaching to two or more content domains which were linked together in a logical activity sequence within a training session. For example, language and fine motor skills might be a part of an instructional sequence involving mealtime behaviors.

Similar models of organizing to provide instruction have been suggested by other authors. Sedlak and Sedlak (1982) suggest that instructional areas should be divided into two groups. One group were activities that should be taught directly (for example, self-help, recreation/leisure skills, community or vocational skills). The second group (for example, language skills, motor skills, or cognitive concepts) are areas that were best taught interspersed into the functional areas listed above.

One source of support for the skill cluster approach came from a study by McCormack, Cooper, and Goldman (1979) who found that 50% to 78% of teacher and aide time was taken up in caretaking activities such as diapering, toiletting, feeding, dressing, transporting etc. They suggested a model in which teachers overlay instruction in caretaking activities as a means of maximizing instructional time. This model was similar to that suggested by Guess and Sailor's (1983) skill cluster model of organizing for instruction. McCormack et al (1979) found that with a minimum amount of instruction focused on integrating instruction into caretaking activities student teachers were able to significantly increase the amount of daily instruction. The importance of this finding was suggested by the results of a study by Fredericks, Anderson, Baldwin, Grove, Moore, Moore, and Beaird (1979) which demonstrated that one indicator of teacher competency which accounted for the major differences between students who made high gains and those who made low gains was the number of minutes of instruction per day.

Organization of the School Day

The transition towards functional targets taught in context at naturally occurring times required a change in organization of the school day. Guess and Helmsteter (1986) suggested that the traditional classroom activities such as language sessions, fine motor groups and perceptual development time were inappropriate as organizers for activities. They suggested a schema that focused on daily routines such as arrival activities, lunch preparation, toiletting, interactions with peers at recess. What has been traditionally viewed as prime instructional time has been frequently the most difficult for teachers to schedule with functional activities in meaningful contexts. Guess and Helmsteter (1986) acknowledged this and suggested that teachers should at the minimum try to naturalize the order of the activities for example by scheduling cleanup activities after messy ones in order to develop a normal rhythm to the day.

Natural Environment

Another factor which made it necessary for teachers to greatly change how their program was organized was the requirement that students be ultimately able to perform target skills in their natural environment. As previously noted, general acceptance of the criteria of ultimate functioning as the guideline for selection of instructional content led to a situation where many of the skills considered most important for a child to master occurred naturally outside the traditional instructional environment of the school and classroom. For a skill to be truly functional, a student should be able to perform it under natural conditions, that is, where it normally happened, with the materials naturally used, and given the cues normally present in the environment. In addition correct performance should be maintained by the naturally occurring consequences. Appropriate instructional design required that planning include a process to ensure that the student would demonstrate the skill when and where it was required.

It has been well-documented that providing instruction only in the school environment was usually not sufficient to develop skill mastery in the natural environment. One learning characteristic common to the severely handicapped has been their difficulty in generalizing skills learned under one set of conditions to another (Warren, Rogers-Warren, Baer, & Guess, 1980). For this reason, Stokes and Baer (1977) identified the inadequacy of the "train and hope" approach to generalization that characterized early instructional programs and suggested that specific strategies be used to facillitate generalization. The movement toward teaching functional skills under conditions that approximated as closely as possible the natural conditions was to a great extent an attempt to overcome difficulties related to the lack of generalization found in earlier training and to include techniques to systematically enhance it. The fact that severely handicapped persons generally did not transfer skills learned to novel persons, places, or conditions without direct training made it necessary for educators to realize that training a skill to criterion in the classroom environment was usually not sufficient to ensure that the individual was able to use that skill in situations where it was required.

Location of Instruction

One issue related to this concept was where instruction should take place. In a position paper, Brown, Nisbet, Ford, Sweet, Shiraga, York, and Loomis (1983) catagorized four instructional location strategies (school instruction only, consecutive instruction, concurrent instruction, and nonschool instruction only) that could be incorporated into the design of instructional programs.

Given the learning characteristics and limitations of the severely handicapped previously discussed, instruction of a skill only in the school environment was of limited utility. This approach to training could only be justified if the school was the only natural environment in which the skill was required or if training was accompanied by probe trails in natural environments to ascertain if the student could perform the skill there.

The consecutive strategy required that a student perform a skill to a specified criterion before permitting training in nonschool environments. While this approach might be deemed appropriate in some situations, such as in the case of extreme behavior problems, evidence has suggested that care must be taken to avoid creating artificial barriers to community training. Brown et al

(1983) noted that behavior problems might not occur to the same extent in another environment. Limitations of the use of the strategy were also demonstrated by Neef, Iwata, & Page (1978) who found that actual performance on buses in the natural environment was not directly related to performance in the classroom. They found that the behavior of the subjects in the natural environment was controlled by a different stimulus than had been trained in the classroom.

Students may not need to demonstrate prerequisite skills prior to instruction in their natural environment. The importance of the environmental dimension to skill acquisition with mentally retarded adults was demonstrated by the work of Klienberg amd Galligan (1983) who reported improvement in skills by persons living in institutional settings immediately upon entering the community. They found, however, that there was a subesequent levelling off in acquisition rate over time. O'Neill, Brown, Gordon, and Schonhorn (1985) found a pattern of skill development with severely and profoundly retarded adults which suggested the institutional environment might have suppressed the emergence of some skills that could emerge naturally to some level in a more diverse environment. This conclusion was supported by laboratory based studies (Ben-Yishay, Diller, Girstman, & Gordon,1970; Birch & Bortner ,1966 & 1967) which showed that providing effective instructional strategies was sometimes a matter of creating adequate stimulus characteristics to release inherent abilities. These results supported the use of concurrent instruction and non-school location instruction strategies.

It has been generally recognized given the learning characteristics of persons with severe handicaps that exposure to the natural environment was usually not sufficient in itself achieve acquisition or mastery of a particular skill (Baker, Seltzer, & Seltzer, 1977). Heal, Laird, Colson, and Gross (1984) found that direct systematic training in the natural environment led to greater acquisition than simple exposure. Success in systematically training skills in community environments has been demonstrated in the areas of teaching self-care routines in a group home (Freagon & Rotatori,1982); shopping in supermarkets (Ford, 1983; Wheeler, Ford, Nietupski, Loomis, & Brown, 1980); pedestrian skills (Vogelsberg & Rusch, 1979); riding busses (Coon, Vogelsberg, & Williams, 1981; Sowers , Rusch, & Hudson,1979); eating in restaurants (van den Pol, Iwata, Ivanic, Page, Neef, & Whitley,1981) using recreational facilities (Hill, Wehman, & Horst,1982)

While the relative efficiency of training in natural environments versus artificial training sites has yet to be resolved, there have been indications that training in natural settings has educational advantages. Schalock,Gadwood, Brown, and Perry (1984) found that students acquired significantly more domestic skills when they were trained in their own apartments as when training occurred within a centre based facility. These findings are consistent with other studies on training in the natural environment (Freagon & Rotatori,1982; Markholm, O'Toole, Touchette, Berg & Doyle, 1979; Page, Iwata, & Neef, 1976; Robinson, Griffith, McCormish, & Swasbrook, 1984).

A final method of determining the location for instruction is the concurrent approach (Brown et al., 1983). Concurrent instruction referred to providing direct, systematic, and individualized instruction in both school and nonschool environments on a reqular and frequent schedule. This model had the advantage of providing more opportunities for instruction and reduced to a more manageable level the expense and organization required for planning community training.

The research literature has developed some guidelines with respect to where instruction should occur. Sailor, Halvorson, Anderson, Goetz, Gee, Doering, and Hunt (1986) provided teachers with standards that could be utilized as a guide to determine the proportion of instructional time spent in classroom, other school, and nonschool environments. Generally their guide, based on chronological age comparisons, suggested that the proportion of time spent in nonschool environments should increase as the student grows older.

The shift to a community intensive instructional program has created logistical and administrative issues that must be addressed in order to permit effective implementation. Ford, Miranda, Shiraga, Zanella, Nisbet, and Loomis (1983) indicated that most constraints to model implementation fell within the catagories of administrative-logistical (liability insurance, transportation, staff ratios, cost factors); parent factors (safety); student concerns (needs for physical adaptations); teacher factors (degree of committment to the model which appeared to be related to recency of training).

Use of Functional Materials

The requirement that children are able to demonstrate skill competencies in a variety of natural environments has forced researchers to work toward instructional strategies which enable this to occur. Stokes & Baer (1977) and Walls, Sienicki & Crist (1981) identified the need to use multiple examples in order to increase the likelihood of generalization. However, the use of multiple examples has been demonstrated not to be sufficient to ensure generalized responding (Becker, Engleman, & Thomas, 1975; Engleman & Carnine, 1982). These researchers found that it was necessary to select examples that sampled the range of stimulus and response variables across which responding was desired. Horner, Sprague, and Wilcox (1982) modified this approach for persons with severe handicaps. Its effectiveness for achieving generalized behavior has been demonstrated in studies to teach motor skills to severely handicapped learners(Colvin and Horner, 1983), a generalized vocational skill (Horner & McDonald, 1982), generalized street crossing, (Jones, 1983), table bussing (Horner, Williams, & Stevely, 1983), and generalized use of vending machines (Sprague & Horner, 1984).

Sprague and Horner (1984) suggested that the present emphasis on the development of functional, community-based activities has brought with it a growing need for an applied technology of generalization since it is neither efficient nor possible to train an individual directly for every situation he or she is likely to encounter when given access to multiple community environments. Some pilot samples of curriculum materials have been produced to provide teachers with guidelines for developing instructional programs designed to increase the likelihood of generalization. However, further work in publishing such materials is required if these practices are to become the norm.

Implications for Teaching Strategies

Delivery of Instruction

Hendrickson and Young (1984) found that the systematic delivery of instruction, i.e. introducing an antecedent model and differentially consequating correct responses, correlated with higher rates of appropriate responses than any less rigorous teaching strategies. Teachers with skill in providing immediate feedback (e.g. reinforcement, prompts, or hints) following correct responses and errors produced greater learning than teachers who did not provide immediate feedback (Englert, 1984). While the literature has supported the transfer of such established teaching principles from classroom to nonschool settings (Guess & Sailor, 1983; Snell, 1983), the shift to teaching in the natural environment has a direct and significant impact on how these are implemented.

Community based instructon requires that particular attention be paid to naturally occurring cues and consequences when developing programs (Ford & Miranda, 1984; Falvey, Brown, Lyon, Baumgart, & Schroeder, 1980). Sailor et al (1986) noted that many of the traditional practices such as the use of massed trials and standard delivery of positive reinforcement were either impractical or too stigmatizing to be used in community training situations. This difficulty has necessitated the development of new techniques that meet student needs and can be implemented in a community setting. While there is much work to be done in this area some developments such as the use of an interruption technique to increase student motivation to initiate the use of pictoral communication in an established routine are evident in the literature (Goetz, Gee, & Sailor, 1983).

Task Analysis

Fredericks, Anderson and Baldwin (1979) found that teacher use of task analysis was positively correlated with student achievement. Most research on training functional skills to severely handicapped persons has included task analysis as one component of the training package (Snell & Browder, 1986). These instructional programs were frequently developed by conducting an inventory involving the observation of how the activity was performed by persons who were not disabled. Since these individuals may have had their own community deficits this method did not guarantee that the most efficient process was developed. Thus while it has been demonstrated that use of task analyses enhanced learning, more comparative studies are required to demonstrate the relative efficiency of sequences of instruction (Snell & Browder, 1986).

Selection of Teaching Procedures

Having developed a task analysis to teach a given activity, teachers were then faced with making a decision on how they would proceed to train this activity. Three main approaches have historically been utilized: foreward or backward serial chaining and training the whole task. Serial chaining approaches involved teaching the task one step at a time starting either at the beginning or end of the chain. Total task training involved teaching all steps of the task concurrently. Fredericks et al (1976), Gaylord, Ross and Holvoet (1985), and Sultzer-Azaroff and Mayer (1977) discussed advantages of backward chaining procedures for persons with moderate and severe disabilities. Total task procedures have also been used successfully to teach persons with severe handicaps a variety of skills including vocational tasks (Bellamy, Horner, & Inman, 1979), use of public transportation (Coon, Vogelsberg, & Williams, 1981), Neef, Iwata, & Page, 1978), cooking (Schleien, Ash, Kiernan, & Wehman, 1981), and dressing (Azrin, Scharffer, & Wesolowski, 1976).

A small number of studies have been conducted comparing serial chaining and whole task instruction (Spooner, 1981; Walls, Zane, & Thvedt, 1980; Spooner, 1984; Zane, Walls , & Thvedt, 1981; Kayser, Billingsley & Neel, 1986). Panyan & Hall (1972) found no difference in rates of acquisition between concurrent task sequencing and serial-task sequencing procedures (teaching one skill to criterion, then a second skill). They did find that generalization to nontrained skills within tasks was greater in the concurrent task sequencing procedure. The results reported from these investigations have not revealed conclusively the superiority of one procedure over another (Snell & Browder, 1986).

Trial Presentation and Sequencing

Once the task analysis has been written and the general teaching process established, teachers must decide how to schedule training trials. One method has been to present the total task several times in a session while another was to have the student complete the task or chain of responses only once each training session (Snell & Browder, 1986). This latter approach was suggested by Sailor and Guess (1983). Snell and Browder (1986) suggested that there was some support for the approach taken by Sailor and Guess (1983). Mulligan, Guess, Holvoet, & Brown (1980), in a review of literature on massed versus distributed trials which included studies involving nonhandicapped populations and learners who were mentally retarded, found consistent results favouring distributed over massed-trial training for motor and, especially, cognitive skills. Guess,Jones,and Lyon (1981) collected data over a 3 year period using the ICS model (Sailor & Guess, 1983) and found substantial skill acquisition with preschoolers with severely/multiply handicapping conditions. This study did not contain a direct comparison to other teaching strategies. Brewer (1982) demonstrated a mild effect in favour of distributed trial presentation for generalization of a vocational task across settings.

Neel, Lewis-Smith, Hanashiro,McCarty, & Billingsly (in Guess & Helmstetter,1986) reported considerable success using a functional skill cluster approach teaching students with autism. Other supporting evidence was reported by Dunlop (1984) who found children with autism performed better on varied tasks as compared to sessions when only one task was presented per session. Optimal performance occurred when sessions with varied tasks were intermixed with tasks that had been previously learned. Also learner affect was most positive in sessions in this condition while positive affect was lowest in the constant task sessions. Dunlop & Koegal (1980) found autistic children showed lower levels of responding to cognitive tasks that were taught in a massed trial presentation. Distributed trial presentation produced a decrease in non responding. Mulligan, Lacy, & Guess (1982) found higher response rates among learners with severe handicaps who were taught in an distributed trial versus a massed trial format. A mild effect in favour of distributed trial sequencing with learners who have severe handicaps in terms of frequency of spontaneous initiations was found by Lacy (1982).

Data Collection and Updating

The use of daily data collection in programs for severely handicapped students has been the rule rather than the exception. A variety of reasons for having instructors collect data have been presented. Data have been gathered to provide evidence that learning has taken place, to improve communication among parents, teachers and administrators, and to allow a teacher to make instructional changes that will improve student performance (Hansen, 1978; Liberty, 1976; and Wehman, Bates, & Renzaglia, 1980). The most common reason for collecting data has been to provide an objective measure of student behavior. One study by Holvoet, O'Neil, Chazdon, Carr, and Warner (1983) found that trained instructors were accurate in judging a student's current level of performance with or without data collection. However these authors also found that comparative judgements concerning a student's previous and present performance and decision making regarding future programming were adversely affected when data were not recorded. Fredericks, Anderson and Baldwin (1979) in a large scale research project on the parameters of teacher-training effectiveness found that measured instruction was one of the few variables that reliably predicted child change as a function of teacher effectiveness. They found that the more teachers collect and utilize their data, the faster the student's progress.The information presented here suggests that teachers should be collecting at the very minimum sufficient data to allow them to make decisions regarding the adequacy of ongoing instructional programs.

Sailor and Guess (1983) suggested that while data collection was important, it could be time consuming and if over used take up valuable teaching time. They suggested that in addition to trial by trial data, teachers could use time saving techniques such as probe data and time sampling to provide them with objective information. Current literature has not identified standard procedures with respect to the most economical means of collecting sufficient data.

The information presented to this point has provided an overview of the broad impact of the shift toward a truly functional approach on the organization of educational programs for the severely handicapped. It has also suggested that while some guidlelines are available for teachers there remains a great deal of information for which supporting research is not available. A discussion of the inservice requirements of teachers of the severely handicapped in order to implement a functional program follows.

Need For Inservice Training

Rationale

Several authors have suggested that effective pre- and post-service training of special educators, regular teachers, and administrators is an essential prerequisite to successfully preparing students with severe handicaps to live in complex community based environments (Baine & Csapo, 1985; Brooks & Paul, 1982; Sobsey, 1985). The 1981 UNESCO report of Experts on Integration of Severely and Multiply Handicapped Persons into General and Vocational Education recommended that training for educators of this population be given a high priority.

Despite the fact that there has been a direct relationship between the seriousness of the student's disability and the competence necessary for their teachers (Sontag, Burke, & York, 1973) educational programs have historically been characterized by minimally trained personnel (Stainback, Stainback,& Maurer, 1976). The responsibility, mandated by P.L. 94-142, of providing a free public education for all handicapped persons placed additional demands on the educational system. Educators who had been trained to deal with mildly disabled children or with children with a specific single handicap were now responsible for the instruction of children with severe and multiple handicaps (Browder, 1983). In order to instruct these children, teachers needed to acquire new knowledge and teaching expertise which made the requirement for additional training urgent (Wilcox,1977).

In spite of the need for special training in order to offer a quality educational program, most provinces in Canada have not required training specific to the severely handicapped or even certification in special education (Werner, Chandorkar, Georgeff, Inrig, Nichols, Scott, Tompkins, & Youngson, 1982). The result has been that many persons acquire permanent positions without adequate preservice training. Also the present situation of declining enrollment has resulted in very little staff change, so the influx of new staff into school systems has been very slow. This combination of circumstances has increased the importance of providing inservice training as a means of upgrading staff expertise in the schools. Snell, Thompson, and Taylor (1979) noted that while many American universities have established full-time pre-service training programs the inservice needs of practising teachers have often been neglected.

Egbert & Kluender (1979) suggested that it was unreasonable to assume that a given training period could prepare a person for a lifetime in any complex profession. The rapid rate of expansion of knowledge has made it imperative that even properly trained teachers continue to upgrade their skills (Browder, 1983). Mercer, Forgnone, and Beattie (1978) stated that in order to maintain professional status some sort of upgrading or ongoing input had to occur. Thomas (1980) suggested that teachers should be required to engage in continuing/ongoing learning opportunities through inservice training in order to stay abreast of new ideas, research, and information in the field.

Inservice training has been suggested as an effective method of distributing new information (Browder, 1983), upgrading teacher skills (Gage, Fredericks, Johnson-Dorn, & Lindley-Southard, 1982), changing attitudes, and teaching alternate strategies (Tucker & Horner, 1977). It may also have a significant positive impact on the quality of current programming (Ryor, Shankar, & Sandefur, 1979).

While inservice training has remained an obvious means for improving the quality of educational programming, a number of studies have indicated that its positive impact can be limited by factors such as lack of relevance (Joyce, Howey, & Yarger; 1977), ineffective instructional strategies, and lack of feedback (Borg, Kallenback, Kelley & Langer, 1970). Browder (1983) suggested that the development of an effective inservice required pre-planning which addressed the following issues: identification of objectives, determining an appropriate level of intensity, selection of effective methods of content delivery, selection of qualified training staff, incorporating incentives, and evaluation of effectiveness.

Selection of Content

Development of an effective inservice has required delineation of the skills and competencies needed by teachers of severely handicapped children. These must then be limited to a realistic number of relevant objectives. Skrtic, Knowlton, and Clark (1979) and Healy (1983) suggested that relevant content be determined from a number of sources including the teachers themselves. Dillon (1979) found that teachers felt that material that was practical and directly applicable to be of most value. Browder 1983) stated that it may also be necessary to refer to the research literature for guidance in selecting critical staff competencies as teachers may not be able to clearly identify their needs due to limited knowledge of effective teaching strategies or poor self-evaluation skills. Snell et al. (1979) suggested that teacher-requested needs should be validated by classroom observation. These observations, in addition to confirming the need for for inservice training in particular areas may also be employed to reveal other training needs (Browder, 1983).

Development of Objectives

Once the objectives of the inservice are determined they should be written in a clear behavioral format (Korinek, Schmit, & McAdams, 1985). Criterion levels delineating acceptable levels of performance should also be included (Templeman, Fredericks, Bunse, and Moses, 1983). This information should be communicated clearly to participants (Hentschel, 1977).

Methods of Presenting Content

Appropriate methods of presentation are determined by the objectives of the inservice. Surveys have suggested some guidelines of teacher preferred strategies such as active participation, self-directed learning, and use of multiple media as opposed to lectures alone (Mann,1976). Jensen et al. (1978) found demonstrations of materials and techniques, directed small group discussion, working groups, lectures followed by discussion, and brainstorming opportunities to be preferred techniques identified by teachers. Teachers also rated positively the opportunity to practise skills in their own classrooms with feedback (Hentschel,1977). Some optional selection of content and activities was also found to be desirable (Skrtic et al., 1979).

Research on effectiveness of inservices has validated some of these preferences. Gardner (1972) and Sepler and Myers (1978) found that lectures, discussion and written texts did not lead to improved practice in real or simulated situations. Even when these techniques were used in conjunction with frequent verbal and written reminders to use the techniques that have been learned in training reliable change in staff behavior did not occur (Quilitch, 1975). Gardner (1972) found that modelling used in conjunction with other techniques such as role-playing resulted in greater changes in performance than did traditional lecture methods. Houston & Freiberg (1979) found that active participation enhanced the effectiveness of inservices. Korinek et al. (1985) found supervised practise and specific feedback to be more effective than traditional approaches which simply presented information to teachers. While Kelly and Vanvactor (1983) found that practicum experiences helped to maintain the skills learned in inservices.

These findings led to the development of training packages that used a variety of instructional techniques. Foxen and McBrien (1981) combined written material, video-taped lectures, and role-play while others included self-evaluation by video-tapes of their own teaching (McConkey & O'Connor, 1981; Robson, Jones, & Storey 1982).

Location of Inservices

Wilcox (1977) recommended that inservice delivery should approximate as closely as possible classroom conditions. However, Templemen et al. (1983) recommended that inservice training should initially take place in a demonstration classroom rather than the teacher's own class. They felt that demonstration sites had the advantage of showing the model in its entirety while removing the teacher from potential distractions likely to arise in their own classrooms. School based training has been found to enhance teacher acceptance of content (Dillon, 1979) and make the inservice more effective (Korinek et al., 1985).

Selection of Participants

Korinek et al. (1985) suggested that selection for training should be voluntary. Selection determined on the basis of the teacher in the greatest need tends to stigmatize the participants. Paul (1983) suggested that inservice training programs should be aimed at all school personel. Administrative involvement and support for example was found to encourage staff participation and implementation of content (Korinek et al., 1985).

Teacher Attitudes

Steps must be taken to maximize a positive attitude to participating in inservice training programs. This orientation can be accomplished by helping teachers recognize the need for change in a nonthreatening manner such as through information from relevant journal articles, conferences, or visitations (Hentschel,1977). Korinek et al. (1985) suggested the use of rewards as incentives for participation. Browder (1983) identified release time, payment, academic credit, increased salary, and renewal of certification as some potential rewards. In addition, Henschel (1977) found that motivation was increased when training was directed towards teacher identified needs, provision for ongoing support was available, enhanced student performance was demonstrated and personal recognition was given.

The credibility and efficiency of inservice presentations are enhanced when there is co-ordination between different agencies or professionals who may deliver inservices (Skrtic et al, 1979) and by the participation of effective teachers in delivery of the training (Healy, 1983). Despite this, Mann (1976) cautioned against the use of local school collegues as trainers noting that successful projects were often ignored by their collegues perhaps due to professional jealousy and the inability to take credit for ideas copied from someone from the same environment.

Evaluation

Browder (1983) suggested that evaluation of the effectiveness of inservices while important has historically been poorly conducted or ommitted. Adams (1977) in an analysis of inservice evaluation procedures found that about half of the 135 models surveyed used pre and post training measures of knowledge acquisition. However, as Madle (1975, cited in Madle, 1982) noted, testing for academic knowledge of content also does not deal with the issue of staff performance . Browder (1983) suggested that this type of evaluation was only applicable in situations where the objective was to impart knowledge that has no direct relatiionship to staff performance such as the side-effects of medication.

Adams (1977) also found that only 39% of the models surveyed used post-training evaluation. Of these, 7% used questionaires to participants, 3% incorporated on site follow-up, 1% used pre and post data from the field site, and 1% employed a competency checklist on follow-up.

Traditionally participant satisfaction with the content of the inservice has been a commonly used assessment (Mercer et al., 1978). However, Quilitch (1975) found no relationship between a staff's positive evaluation and subsequent performance.

The major objectives of most inservice are aimed at bringing about change in teacher performance that will in turn alter and enhance student learning and performance. Therefore, Browder (1983) and Bernstein and Ziarnik (1982) recommended that measures of teacher and student change related to the inservice objectives should be taken through direct observation of these individuals in their natural learning environments. Powers (1983) suggested that the effects of an inservice should be assessed across time in an incremental manner. One means of conducting such systematic observations in classroom situations is through the use of applied behavioral analysis designs such as reversal, multiple baseline (Kratochwill, 1978; Hersen & Barlow, 1976) or changing criterion designs (Hartman & Hall, 1976). Some studies have attempted systematic evaluation of change in teacher and student performance following an inservice training program (Grigg, 1983; Jones & Robson, 1983).

The literature reviewed to this point has supported the need for and the appropriateness of the provision of systematically developed inservice programs to prepare teachers of students with severe handicaps to implement a functional, age-appropriate curriculum. Also, it has suggested specific guidelines for developing training packages which can be used to increase the probability that the inservice will result in changes in the performance of the participants and which in turn will enhance the performance of the children they teach.

Summary

The preceding review of the literature has demonstrated that over time there have been various theoretical foci and beliefs about persons with severe handicaps that have directly influenced the content of eduational curricula for this population. Initially the combined effect of the extent of their disabilities and limited clinical knowledge resulted in the belief that these individuals were incapable of learning. Thus an educational curriculum was not seen as realistic or necessary. Improvement in the technical skills of researchers and educators through the application of operant theories of learning to instruction was a major break through. Applied behavior analysis provided a set of basic procedures which permitted instruction to be successful but did not specify what appropriate content should be.

Initial selection of curriculum content focused heavily on the elimination of aberrant behaviors characteristic of individuals who live in institutions. Also training was aimed at teaching self-care and communication skills. Theories of child development provided educators with some guidelines for the selection and sequencing of skills to be taught. These sequences, however, proved to be more appropriate for young children than for adolescents and adults.

The impact of the philosophy of Normalization (Wolfensberger, 1969) and PL94-142 have over the years profoundly influenced our view of the needs and rights of severely disabled persons. The results of this shift in perception were and are seen in new instructional goals, content, and methods of instruction. Current research literature has suggested the presence of a general consensus that the ultimate goal of instruction should be aimed at preparing the individual to participate as fully as possible in a wide variety of community settings. In order to accomplish this objective, students must be taught directly skills which educators, parents, potential employers, non-handicapped peers, and community members indicate are needed in multiple environments. Selection of activities should be priorized individually, based on the unique charateristics of the individual as he interfaces with his particular environment. Giudelines outlining the general content areas from which activities should be selected to provide a well balanced program have been developed. Skills selected for instruction should be taught through activities that are functional and appropriate considering the student's chronological age.

In the area of designing instruction to accomplish these goals, the research has suggested a number of general guidelines: the use of systematic teaching procedures derived from the technology of applied behavior analysis is required in program development, task analyses of skills to be taught; a method of sequencing instruction to teach the task analysed skill; systematic use of cues and consequences; and a method of data collection which will form the basis for measuring progress and modifying program delivery. While the literature has provided alternatives for the program developer to choose from in this endeavor, in many cases the practitioner is required to make instructional choices in areas where there is no clear direction as to which of the many alternatives was most appropriate for a given student in a particular situation. For example, as was previously stated, there are no clear guidelines to assist a teachers in determining whether to teach a skill via serial or whole task instruction.

The learning characteristics of persons with severe handicaps and the ultimate goal of having the student be able to perform functional skills as independently as possible under naturally occurring environmental conditions have made it necessary for teachers to alter the manner in which skills are taught. There is an increased emphasis on the importance of teaching skills in the context of functional activities, using materials that sample the range that would be found in the natural environment. Frequently the optimum location for instruction is outside the classroom. All of these changes have been recommended to systematically program for generalization of performance to the natural environment. The effect of these changes is to drastically alter the traditional model of instruction. The extent of these changes has suggested that teachers require intensive and specific training in order to possess the attitudes, knowledge, and skills to implement them effectively.

The literature reviewed also identified the need for additional training on the part of many teachers of students with severe handicaps either because they have not recieved specialized pre-service training or as a means of acquiring new skills based on recent research findings. Inservice training was suggested as the most viable option for delivering this training and the general requirements for the development and evaluation of an effective inservice program were outlined.

On the basis of the above current literature on recommended instructional strategies, appropriate curriculum, and methods of inservice training, the educational staff at CAPE developed the STEP inservice program. A discussion of the objectives, content, and format of the S.T.E.P. Inservice program, which served as the independent variable in this study, is provided in Chapter Three.

Chapter III

DESCRIPTION OF THE S.T.E.P. INSERVICE

The Systematic Training for Educational Programming Inservice Training Model (S.T.E.P.) was developed to train teachers working with severely and profoundly handicapped students in classrooms in Northern Alberta. This training package was based on the Teaching Research Inservice Model developed by the staff of the Special Education Department of the Division of the Oregon State System of Higher Education (Federicks, Baldwin, Grove, Riggs, Furey, Moore, Jordan, Gage, Levek, Alrick & Wadlow, 1979).

Modifications were made for use by the Edmonton Public School District. These modifications included the addition of sections focusing on functional assessment, functional curriculum, behaviour management, total task teaching, and working with classroom staff. In addition, some modifications were made to other sections. The instructional design module stressed the use of functional cues and consequences rather than strictly verbal cues and consequences. The group programming module focused primarily on teaching activities in groups rather than the use of stimulation activities, and the data analysis module has been expanded to include the updating of total task sequences.

Objectives of the S.T.E.P. Inservice Training Package

The major objectives of this inservice model were to develop teacher competency in the use of the strategies itemized in Appendix 1.

Content

Day one of the training week was devoted to orientation and observation of a demonstration classroom operated by a trained teacher. This experience provided the inservice participant with an opportunity to see the model operating in its entirety and acted as a reference point during the following four days of training. During days two to five, participants were presented with various activities and lectures which led towards the completion of the inservice objectives.

Direct practicum experience was an integral part of the training. These practicum experiences were highly structured and follow a format of:

1. Demonstration of the task or role by a staff trainer.
2. Preparation for the task or role under the guidance of a staff trainer.
3. Performance of the task or role by the trainee.
4. Formal observation and feedback to the trainee on a frequent basis.

The content for the inservice model has been continually modified through teacher, classroom aide, principal, and consultant input. At the close of each training week the participants were asked to give feedback on the parts of the training which were beneficial and those areas which were not considered to be appropriate. Suggestions for change were encouraged. Updating of the content occurred regularly in response to expressed need. It was believed that content which was directly applicable to teachers would be more valuable and have a more lasting effect (Dillon, 1979).

A discussion of the inservice components follows.

Assessment/Curriculum

This module involved the presentation of various ecological assessment strategies. The use of ecological inventories, observational assessments, and parent interview strategies were presented. The importance of integrating instruction into caretaking activities and functional - activities was emphasized. Advantages and limitations of standardized assessment and curriculum packages were also examined.

The module was presented through lecture format with video tape and overhead support. The trainee's participated in practice sessions designing functional teaching sequences and administering standardized assessments. The homework assignment consisted of the trainee designing a functional teaching sequence based on three IEP goals for a student.

Instructional Design

This module consisted of a discussion on the appropriate method of delivering cues and consequences to students. The section on cues included a description of rules governing the administration of cues, types of cues, suggestions for enhancing cue delivery, and generalization of cues. The section on consequences addressed the different types of consequences - reinforcement and correction procedures, types of reinforcement, the use of reinforcer checklists, the use of primary reinforcement, natural reinforcement, and the use of natural correction procedures.

Practice of the techniques learned during the instructional design lecture occurred during the practicum experiences. The homework assignment consisted of answering study questions related to the lecture and readings information.

One to One Instruction

Teachers were taught the roles and responsibilities of staff when they were involved in individual instruction. This information was provided through lectures and prescribed readings from A Data Based Classroom (Fredericks et al., 1982). Teachers experienced practice sessions in this role in the training classroom. During these sessions their performance was monitored by training staff who determine baseline performance scores and provide corrective feedback directly related to the performance objectives. Skill mastery was determined when the teacher reached or surpassed the criterion designated in the performance objectives.

Instruction was also provided to prepare teachers to write individual instruction programs according to the guidelines contained in Fredericks et. al. (1982). The essential components of a cover sheet, general information, program cover sheet, task analysis, and various data formats were discussed. A training manual containing recommended readings provided teachers with additional information to explain how to create a package of written programs for an individual student. Evaluation of mastery of this component was measured by the teacher's performance in a written exercise which required the development of written programs for a student in two instructional domains.

Supervision of Staff

Teachers were trained to utilize Individual and Group Observation Forms (Fredericks et. al., 1982) to supervise and evaluate performance of classroom staff in terms of their ability to appropriately deliver cues and consequences and record data. In addition the staff member's ability to involve all students in group activities and to provide a positive learning environment was measured.

An explanation of the components of each form was provided through a lecture and assigned readings. Teachers practised using the Individual Observation Form by watching staff role-play. They completed the Group Form while viewing a videotape of a small group instruction session. Demonstrations of reliability with training staff using both forms occurred in the demonstration classroom.

Teachers were also taught guidelines for delivering feedback to classroom staff based on their performance during group and individual instruction through a lecture, readings, and observation of trainers. In the training classroom teachers provided feedback to classroom staff whom they observed under the supervision of the training staff.

Data Analysis

Teachers were presented with a set of rules for analyzing program data for both individual and group programs. These rules were used as a basis for making modifications to instruction based on student performance. The guidelines were based on the recommendations of Fredericks et. al. (1982). Instruction was provided through lecture, role-play, and a practice session in which teachers update actual programs of students in the training classroom under the supervision of the training staff.

Teachers were provided with supporting resources in the form of a self-instruction package and recommended readings from Fredericks et al. (1982). Mastery of the instructional content was based on performance on a written exercise which involved updating a sample of the written programs for one student.

Group Instruction

This module consisted of the presentation of guidelines and strategies which could be used when working with groups of students. The importance of group instruction as a method of encouraging interaction with peers and appropriate language skills in context was emphasized. Suggestions for functional activities which were appropriate for group instruction were presented as well as a strategy for developing activities. Various methods of data collection were also examined. The homework assignment consisted of the teachers generating a list of appropriate activities around a functional theme.

Working with Parents and Teacher Aides

Strategies for working effectively with parents and teacher aides were presented in this module. Topics included the importance of encouraging parent/teacher communication, methods for promoting communication, improving communication with teacher aides, defining classroom responsibilities, and resolving conflicts. Teachers were encouraged to present strategies which have worked in their classrooms to enhance their relationship with both parents and classroom assistants.

Behavior Management

This module focused on the communicative aspects of behavior. The steps in completing a functional analysis of behavior, measurement of behavior, reinforcement strategies, and a description of various intervention techniques were included. A taxonomy for classifying behavior adapted from Donnellan, Mirenda, Mesaros, and Fassberder (1984) was also presented.

Total Task

This module focused on the importance of total task instruction and the steps involved in developing total task instruction. It included writing the program, cues, consequences, setting the criterion for advancement, data collection, updating, and deciding what skills are appropriate for total task instruction.

Training Sites

The inservice package included both training at a supervised demonstration center and follow-up at the teacher's own classroom (Templeman, et al., 1983). The ~~initial~~ training involved a 1-week training session at a designated training site in an Edmonton Public School District classroom for Dependent Handicapped Students. The staff at the demonstration site were trained in the model components and the class met or exceeded the implementation criteria.

The demonstration site used was chosen to be as close to the participants own class as possible in terms of student population, materials and staff ratio. This feature was based on Wilcox's (1977) premise that conditions which teachers can expect to encounter in their classroom are duplicated as closely as possible during training in order to facilitate generalization of content.

Follow-up

Follow-up training and evaluation was provided at the teacher's own classroom. This aspect of training provided on-site feedback for the teacher and enabled the trainer to give practical suggestions.

Instructional Procedures

The inservice package combined a variety of different activities in order to maintain appropriate pacing (Healy, 1983) and provide a balance of activities (Jensen, et al, 1978). Live demonstration of strategies, and active participation by the teachers was incorporated into each of the modules. This feature supports Mann's (1976) premise that those activities designed to maximize active participation were the most beneficial. Supervised practice paired with specified feedback was used in most of the modules (Korinek, et al., 1985). See Appendix 2 for

Selection of Staff

Staff participation in the training package was voluntary as recommended by Korinek, et al, (1985). Also, administrator support of the teacher's attendance at the inservice wass encouraged (Korinek, et al., 1985). The need for consultant support to be provided during the follow-up was agreed to by the teacher prior to the teacher's attendance at the inservice (Healy, 1983). This assistance provided support to the teacher in implementing the strategies presented as suggested by Templeman et al. (1983). It was provided over time to provide ongoing assistance as recommended by Mann (1976).

Incentives

The inservice was scheduled during the school day so that teachers did not have to use their own time to attend. This procedure was identified by Jensen et al. (1978) as a form of incentive to teachers. A substitute teacher was hired to cover the teacher's class during her week attendance at the inservice so that the distractions during the training week are minimal.

Evaluation

The effects of the inservice training were evaluated through direct observation of the objectives listed in Appendix A. This evaluation occured both during the training week and during the follow-up visits.

During practicum experiences, each participant was formally observed in his/her interactions with students. The trainee's performance was recorded on an observation form and at the conclusion of the observation period the teaching performance was reviewed with him/her. Trainees were observed working with students in 1:1 and group situations. In addition, each trainee observed the demonstration staff in each of the roles and completed the observation form. They were then observed giving feedback to the staff both in the 1:1 and group situations. Feedback was then given to the trainee on their performance.

Homework assignments were completed each evening during the training weeks and marked on the following morning. Feedback was given to each trainee on their performance and revisions were encouraged if the trainee had difficulty with the assignment.

Follow-up visits to the trainee's classroom were designed to measure maintenance of specific teaching skills acquired during the training sessions and to provide further training to remediate any difficulties the trainees may have encountered in the application of methods learned during the training session. For the purposes of measuring the degree of implementation separate components were defined. These components were described on a rating sheet which indicated procedures for making observations, data collection, and criteria levels necessary for satisfactory implementation.

After each follow-up visit the teacher was provided with a letter, outlining the teacher's progress in each area and suggestions for improvement. This letter was not sent to administrators unless requested by the teacher.

Templeman et al. (1983) reported the results of their study evaluating the effectiveness of the Teaching Research Inservice Training Model with 99 trainees. They found that 98% of the objectives during training were completed at specified criterion levels by each trainee. When observed in their own teaching sites, trainees demonstrated the implementation of 99% of the components at criteria. Also, gain scores achieved by students in classrooms where the teacher was trained in the Teaching Research In-service Model indicated significantly greater skill gains ($p < .001$) than did a similar sample of children not utilizing the model.

Summary

The preceding discussion has described the S.T.E.P. Inservice Training Model which was developed to upgrade teacher's competencies in educating students with severely and profoundly handicapping conditions. This type of in-service model was necessary due to the complexity of needs of this population (Wilcox, 1977) and the lack of pre-service training focused on the teaching techniques appropriate for these students (Brooks, 1983).

The techniques described in the literature, which facilitate an effective inservice training approach were incorporated into the S.T.E.P. training in order to maximize the probability that this training would have an impact on the staff's behavior in the classroom. It is clear from the literature cited that the only way to meaningfully evaluate inservice training is by measuring the effect of the inservice on the behavior of the teacher in her own classroom and the resulting impact on the behavior of the students. As a result, in this study, systematic observations of the students in classrooms where teachers participated in the inservice training were taken to measure the impact of the training program. Chapter Four discusses the rationale and the specific research questions which were investigated. The methodology used to answer the research questions is presented in Chapter Five.

Chapter IV

RATIONALE

The literature review has highlighted the recommendation that curriculum content for persons with severe handicaps should be functional and chronologically age-appropriate. This approach to curriculum selection developed as a result of the need to provide educational programs which would maximize the competence that persons with severe handicaps are able to demonstrate in a variety of community settings. Research has demonstrated that teachers require both knowledge and competencies to select instructional objectives which meet functional criteria. Also, they must possess the ability to develop and implement sophisticated programs which will maximize the likelihood that the student will be able to utilize the skills taught in a variety of current and subsequent least restrictive environments.

The recency of this current trend in educational programming as well as the fact that many school districts still have not required teachers of the severely handicapped to have specific training with this population has led to a situation where many teachers do not possess the skills previously identified to the extent that would be desired. Inservice training has been suggested as an appropriate means of imparting the recommended attitudes, knowledge, and skills to teachers currently working in the field.

Unfortunately, as Browder (1983) noted, descriptions of effective training programs have rarely been found in the research literature. However, the research literature has provided guidance with respect to the design and implementation of inservice programs which may increase the likelihood that skills acquired during inservice training would generalize to the classroom.

Clearly, as well, the only effective method of evaluating the impact of a particular inservice packet lies in systematic observation of the behavior of staff and students in their natural setting following training. The present study has taken the position that both the type of activities in which students are involved and the level of involvement reflect teacher's priorities and his or her ability to implement them. Therefore, in the present study, repeated observations of the students were conducted within the classroom setting to assess the impact of the training program on the amount, type and instructional intensity of educational content.

Research Questions

A listing of the specific research questions to be answered by the present study follows.

Research Question 1

As a result of training, was there a significant increase in the percent of intervals during routine tasks when students

a) were involved in activity,

b) received direct instruction,

c) received instruction based on written programs,

d) had their perfromance monitored through data collection?

Research Question 2

As a result of training, was there a significant increase in the percent of intervals during one to one activities when students

a) were involved in activity,

b) received direct instruction,

c) received instruction based on a written program,

d) had their performance monitored through data collection?

Research Question 3

As a result of training, was there a significant increase in the percent of intervals during group activities when students

a) were involved in activity,

b) received direct instruction,

c) received instruction based in a written program,

d) had their performance monitored through data collection?

Research Question 4

As a result of training, was there a significant increase in the percent of intervals during freetime activities when students

a) were involved in activity,

b) received direct instruction?

Research Question 5

As a result of training, was there a significant increase across all activities in the percent of intervals students

a) were involved in activities,

b) received direct instruction,

c) received instruction based on a written program,

d) had their performance monitored through data collection?

Research Question 6

As a result of training, was there a significant increase in the percent of intervals students were involved in functional activities?

Research Question 7

As a result of training, was there a significant increase in the percent of functional activities that

a) were age-appropriate,
b) used functional materials,
c) were taught in context,
d) were age-appropriate, used functional materials, and were taught incontext?

Research Question 8

As a result of training, was there an increase in the percent of intervals during which students were involved in functional activities which occurred in the natural environment

a) in the segregated area of the school,
b) in an integrated area of the school,
c) outside the school grounds?

Research Question 9

As a result of training, was there a significant increase during routine tasks in the percent of intervals students were involved in functional, age-appropriate activities which used functional materials and were taught in context

a) at the activity level,

b) involving direct instruction,

c) involving instruction based on a written program,

d) on which data were being collected?

Research Question 10

As a result of training, was there a significant increase during one to one activities in the percent of intervals in which students were involved in functional, age-appropriate activities using functional materials and taught in context

a) at the activity level,

b) involving direct instruction,

c) involving formal instruction based on a written program,

d) on which data were being collected?

Research Question 11

As a result of training, was there a significant increase during group activities in the percent of intervals during which students were involved in functional, age-appropriate activities using functional materials and taught in context

a) at the activity level,

b) involving direct instruction,

c) involving formal instruction based on a written program,

d) on which data were being collected?

Research Question 12

As a result of training, was there a significant increase during freetime activities in the percent of intervals in which students were involved in functional, age-appropriate activities, using functional materials and presented in context

a) at the activity level,

b) involving direct instruction?

Research Question 13

As a result of training, was there a significant increase across all activities in the percent of intervals during which students were involved in functional, age-appropriate activities using functional materials and presented in context

a) at the activity level,

b) involving direct instruction,

c) involving formal instruction based on a written program,

d) which involved data collection?

Operational Definitions

Definitions of the dependent variables used in this study follow.

Functional Activities

These were defined as basic skills found within the content domains of eating, toiletting, mobility training, communication, hygiene/appearance, recreation/leisure, peer interaction, domestic activities, community activities, and vocational activities.

Often these were critical skills by definition of the fact that they would have to be performed by someone else in either a present or future environment, if the student did not perform the tasks for him/ herself. For example, a balance-beam task would not be considered functional because an adult would not perform that task for any student who could not walk the beam. Dressing oneself, would be defined as a functional task because it is an activity that would have to be performed by an adult if the student could not do it.

The definition also included activities that were desirable, although not necessary. For example, playing a video game was a desired rather than a required skill by the foregoing definition. An individual does require leisure

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skills and playing video game is one example of such a skill. A nonfunctional example of a leisure skill would be an adolescent assembling a ring stack.

Age-appropriate Activities

These activities were identified as those usually performed by non-handicapped, age-matched peers or older persons. Age-appropriateness was evaluated without regard to the hypothesized or tested mental age of the student. For example, an animal puzzle might be recommended by the manufacturer for 2- to 5-year-old children. Although this age-range might match the verbal or mental skills of an older student, this activity would not be considered age-appropriate for a 10 year old child.

Functional Materials

Materials that would usually be enountered in the student's own home or community when they were engaged in similar tasks or activities were considered functional. For example, using one's own coat to learn a dressing skill represented an instance of using functional materials. Button boards were not be considered a functional material.

Instruction Within a Functional Context

Skills taught in the context of a meaningful activity which may be either a care taking activity (such as eating or toiletting) or a contrived activity (such as a group cooking activity) were considered to be in context. Teaching the child a communication skill as part of these activities would be considered to be teaching in context as opposed to teaching the skill in a speech session.

Natural Locations

Locations in which the activity was likely to occur were considered as natural. For example, practising removing boots in the cloak room was considered training in the natural environment. Whereas, performing a cooking activity at one's desk in the classroom would be considered as an artificial location for the activity.

Natural locations were described as occurring in the segregated school, integrated school, or outside the school. Segrated school areas were those designated for special education students or staff primarily (for example, the special education classroom). Integrated school locations were areas of the school frequented by nonhandicapped students (eg. hallways, regular classrooms, playground). Outside school was defined as instruction which took place off school property (eg. walking to the store).

Level of Instructional Intensity

Activities were rated as to the intensity of instruction.

a. The lowest level no activity was defined as a situation in which the student was not interacting any manner with either a person or an object.

b. The next level *activity but no instruction* was defined as a situation in which the student was involved in a functional activity but received no direct instruction from a staff member.

c. *Direct instruction* was defined as a situation in which the student was given a direct cue to perform an action with or without assistance, reinforcement for a correct response, or a correction procedure following an incorrect response.

d. *Formal instruction* was defined as instruction that was formalized in a written program.

e. *Formal instruction with data collection* was a level of instructional intensity in which a written program included a system of regular data collection.

Type of Activity

a. *Routine Activities* were defined as essential activities based on physical needs. Exapmles of these activities include toiletting, removal of outer wear, and eating lunch. Essential activities were classified as routine activities whether they occurred individually of in a group.

b. *One-to-One Activities* were nonessential activities which occurred in the context of a one-to-one interaction between students and staff.

c. *Group Activities* were defined as nonessential activities which occurred in a group setting.

d. Freetime Activities were defined as situations when students were meant to be engaged independently in some form of leisure activity.

Chapter Five presents the methodology which was used in this study and describes in detail the observational system that was used in the collection of data to answer these research questions. The results of the data collection process are presented and described in Chapter Six.

Chapter V

METHODS

Subjects

Four teachers who participated in the STEP inservice were the primary subjects in the study. They were selected on a voluntary basis. Following registration for the inservice, participants were asked if they would be willing to participate in the study. The goal of the study was to ascertain if there was an increase in functional program content and instructional intensity in the teacher's own classroom following successful completion of the inservice. In order to measure the resulting change, data were collected on the activities in which the students participated in each of the four classrooms. Since the experimenter was interested in the change in the total classroom, not just individual students, data were collected on the total level of activity within the classroom.

The students in classrooms A, B, and D were all designated as fitting the criteria for inclusion in programs for the dependent handicapped. The students in classroom C all had severe disabilities but had not yet been diagnosed as dependent handicapped due to their age. Two of the classrooms were under the auspices of the Edmonton Public School Board and two were under the Edmonton Separate School Board. One of the Edmonton Public School classrooms was an Early Childhood pre-school classroom.

The students' ranged from 4 years to 18 years. In addition to severe developmental delay, some of the subjects also had a diagnosis of cerebral palsy, motoric disabilities, behavioral disorders, visual impairment, hearing impairment, convulsive disorders, and/or autism. Appendix C lists the specific characteristics of the students.

The teachers and support staff involved in these classrooms varied in their previous training and experience working with this population. Classroom staff information is summarized in Appendix D.

Settings

The two Edmonton Public School classrooms were located in different elementary schools in Edmonton, Alberta. Classroom A served eleven students between the ages of 6 and 17 years. The students arrived at the school at 9:30 AM and departed at 2:30 PM, Monday to Friday. There were three aides and one teacher in the classroom. Only nine of the eleven students in the classroom were observed during the study as one of the students was on extended medical leave and one arrived in the fifth month of the study.

Classroom C served five students from 3 to 5 1/2 years of age. This class involved an early education program located in an Edmonton Public elementary school but funded by the Early Childhood Services, Department of Alberta

Education. The students in this program all had developmental delays and other associated handicapping conditions, but were not all diagnosed as fitting the criteria for dependent handicapped. This program ran from Monday to Thursday, from 1:00 P.M. to 3:45 P.M. There was one teacher and two aides in the program.

The two Edmonton Separate School classrooms, Classrooms B and D, were located in the same elementary/junior high school in Edmonton, Alberta. They were housed in the same wing of the school with one other classroom for younger students who fit the criteria for inclusion in a program for dependent handicapped students. The students in these classrooms attended school from 9:00 A.M. until 3:00 P.M., Monday to Friday. The students were transported to and from school by a private bussing company. Appendix E contains specific information concerning the characteristics of each program.

Research Design

This study employed a time series research design, which has been defined by Campbell and Stanley (1966) as follows;

> The presence of a periodic measurement process on some group or individual and the introduction of an experimental change into this time series of measurement, the results of which are represented by a discontinuity in the measurements recorded in the time series (p. 37).

The rationale for selection of this design is presented below.

Although classical group comparison research designs which involve random assignment of subjects to treatment and control groups offer greater control over possible confounding variables (Campbell & Stanley, 1966), the constraints of this study precluded the use of this type of design. One reason for this was the limited number of special education teachers and children available for study since it was only possible to train approximately eight teachers over the course of the study and of these only four agreed to participate in the research. Also given the heterogeneity of the target student population and the differences in extraneous variables such as teacher characteristics, it was unlikely that random assignment of available subjects would ensure equivalence between the groups .

One alternative to the classical group comparison design would be to evaluate each individual teacher on a pre-posttest basis. This design was not used because it would not provide sufficient information to determine any type of causal relationship. The repeated measures that are characteristic of a time series design were selected to allow the researcher to rule out many rival hypotheses that can not be accounted for by the former design (Campbell, 1963).

Single Subject Design

In the present study the decision to evaluate individual responses to treatment was based on the availabilty of only a small number of subjects and the heterogeniety of the students taught by the teachers in the study.

The use of single subject design was not without its potential advantages. In group design the results are averaged out so that possible meaningful variations are obscured (Glass et al., 1975). Even when the experimental group performs statistically better than the control group, it is possible that some individual members may not have changed or may have even deteriorated.

One characteristic of single subject designs is that the subjects serve as their own controls (Kazdin, 1982).

Because of this, comparisons can be directly made concerning the impact of different interventions. This feature allows the researcher to determine the magnitude of the observed change, which in turn permits her/him to evaluate the clinical significance of the intervention (Gottman,1973). These findings can be of particular interest to those working in applied settings since they must make decisions as to which treatment is best suited to a specific individual (Birnbrauer, Peterson, & Solnick, 1974).

Also since data collected in time series designs provide a continuous record of experimental variables over the entire time period of the study, the researcher has available information that can be coupled with possible relevant non-experimental variables which can serve as a valuable source of post-hoc hypotheses (Glass et al. 1975). Although this information does not allow one to make definitive statements concerning the variables acting on the data, it can suggest potential avenues for future research (Herson & Barlow, 1973).

A final advantage of time series designs is that they are amenable for use in applied settings. They can be inserted into existing programs and cause only minimal inconvenience to those participating in the research (Gottman, McFall, & Barnett, 1969).

Multiple-Baseline Across Subjects

In the present study a multiple baseline design across subjects was utilized. In this design the intervention effects are demonstrated by introduction of the treatment to the different baselines at different points in time (Kazdin, 1982). This design was chosen in preference to the more common ABAB or withdrawal design in which the effects of treatment are replicated in a single subject by alternating application and withdrawal of the intervention (Kazdin, 1982). The rationale for choosing a multiple baseline design is discussed below.

In the present study the use of a withdrawal design was not considered to be a viable alternative. The goal of inservice training is to achieve changes in behavior that are non-transient in nature (Grigg, 1983). These effects could not be evaluated through the use of a reversal design (Kazdin, 1973). Also implementing the procedures recommended in the training program was very labour intensive and encompassed most facets of classroom organization. Thus, it was felt that if teachers believed the new system to be valuable, they would be reluctant to return to previously used procedures (Herson & Barlow, 1976). As a result, there would be a high likelihood that a "carry-over" effect would make a return to original baseline levels unlikely (Glass et al, 1975).

In addition, the use of a multiple baseline design ameliorates ethical concerns associated with the withdrawal or withholding of a potentially beneficial treatment from research subjects which would be necessary if alternate designs were used (Glass et al., 1975). Although the implementation of the intervention was delayed particularly for the last two subjects, this was a function of the staffing constraints of the organization presenting the inservice rather than a requirement of the research design.

There is general consenus in the research literature that the replication of treatment effects across three or four subjects is sufficient to demonstrate the effects of an experimental treatment (Herson & Barlow, 1976). Also an analysis of treatment effects found across subjects may assist in the development of plausible hypotheses involving the interaction of individual characteristics and the treatment strategies. While it is not possible to reach definitive conclusions due to other extraneous variables for which controls are not in place,this information may identify areas for future systematic research (Leitenberg, 1973).

In the present study, the impact of a training procedure provided to teachers at different points in time was measured by recording the percentage of intervals during which students were engaged in the types of activities recommended. The instructional intensity of this involvement was also recorded.

Baseline data were collected on the dependent variables of two classes for a period of several weeks prior to the first intervention. At this time Subject A participated in the STEP inservice described in Chapter Three. Subjects B participated in the inservice training three weeks later. Observations of students in these classrooms continued on a weekly to biweekly basis until the conclusion of the study approximately six months later. For some subjects it was not always possible to maintain at least a biweekly classroom observation throughout the study due to factors such as school holidays, staff meetings, and teacher illnesses.

Due to circumstances beyond the control of the investigator, the selection of Subjects C and D could not be determined until about four weeks prior to the third training session which occurred approximately three months after the second training. Baseline observations were taken on the students in each of these classrooms prior to intervention.

Observation System

The following section describes the specific instruments used and the manner in which they were administered.

The observation system employed in this study was developed by the investigator. The form contained one area for recording each of the variables measured in the study. The form was divided into three major sections. The first identified measures to describe the instructional situation; the second addressed instructional rigor; the third identified measures related to functional instructional content. In order to reduce as much as possible the amount of interpretation and judgement used by observers when taking data, complete operational definitions of each measure were provided.

In this investigation observers manually recorded behaviors using prepared data sheets. Each sheet contained a column designated for recording the behaviors of each child in the class during the observation period. The occurrence of a codeable behavior was indicated by an "x". Figure 1 contains a sample of the observation form.

Data collection was conducted on a weekly or biweekly basis through live observations in the classroom settings. The observations were taken approximately every fifteen

Figure 1

Observation Form

Date: __________

Routine														
Individual														
Group														
Freetime														
No Activity														
Activity														
Instruction														
Written Program														
Data Collection														
Eating														
Toiletting														
Mobility														
Communication														
Hygiene/Appearance														
Recreation/Leisure														
Peer Interaction														
Domestic Community														
Vocational														
Functional														
In Context														
Age-appropriate														
Functional Materials														
Artificial Location														
Natural Location														
Segregated School														
Integrated School														
Outside School														

minutes over a three hour period. During this time each student was observed in turn for 30 seconds in which time all codeable events were recorded as either occurring or not occurring. Each student was observed once during an observation session. The time of day during which the observations were taken remained stable for each classroom over the course of the study.

Reliability of Observations

Naturalistic observations, as previously noted in Chapter Two, have been widely recommended as a preferred means of evaluating the effectiveness of inservice training (Browder, 1983). Since direct observation in the classrooms of trained teachers was the primary measure used to evaluate the effects of the inservice package, it was critical that factors which could adversely affect the reliability and accuracy of the measurements be minimized. Sources of bias have been identified in the literature by Kazdin (1982). The four general catagories considered to be threats to the accuracy and reliability of observational systems are: observer expectancy and feedback, the complexity of the behavior code and the behaviors observed, consensual observer drift, and reactivity caused by the manner in which the observations are collected. The following section will discuss these factors and how they were dealt with in this investigation.

Observer Expectancy and Feedback.

The expectancies of the observer regarding changes in the client's behavior and the feedback that observers receive from the investigators in regard to that behavior represent one potential source of bias that may affect the reliability and accuracy of data collection. However several studies have demonstrated that leading observers to expect change does not usually result in biased observational data (Kent et al., 1974; O'Leary, Kent and Kanowitz, 1975; Skindrud, 1972). The effect is found when expectancies are combined with feedback from the experimenter that differentially reinforces data that is in line with the experimental hypothesis (O'Leary et al. 1975).

In order to avoid this effect in the present study observers were provided with feedback based solely on the accuracy of their observations as suggested by Kazdin (1982).

Complexity of the Coding System and the Behaviors Scored.

Complexity can refer to a number of different parameters. Firstly it can pertain to the number of different responses that are scored in a different period (Kazdin, 1982). It has been found that observers tend to be more accurate and show higher agreement when there are fewer catagories of behavior to score (Mash & McElwee, 1974). Complexity can also refer to the range of client behaviors that are performed (Kazdin, 1982). Several studies have found the greater the diversity of behavior and the larger the number of different discriminations the observers must make, the lower the interobserver agreement is likely to be (House & House, 1979; Jones, Reid, & Patterson, 1974; Reid, Skinrud, Taplin, & Jones, 1973). Kazdin (1982) recommends that observers be trained to record behavior under conditions of the same level of complexity in order to ensure that complexity does not negatively impact on the accuracy of observations. In the present study, practise sessions took place in a classroom serving students similar to those in the study using the recording form developed for the investigation. Training continued until a criteria of 80 per cent agreement was achieved on each variable measured on the form.

Observer Drift.

There is evidence to suggest that over time observers tend to drift from the original definitions of behaviors under observation (Kent et al., 1974; O'Leary & Kent, 1973; Reid, 1970; Reid & DeMaster, 1972; Taplin & Reid, 1973). One of the hazards of observer drift is that it may be difficult to detect in situations where observers constantly work together. In these situations it is possible for high levels of agreement to be maintained although accuracy has declined. In the present study in order to control for observer drift periodic retraining of the primary observer occurred by pairing her with the investigator or another individual trained by the primary investigator but not involved in ongoing observation in the classrooms under study. Also at one point in the study, a newly trained observer was brought into the study and three way agreement was obtained between the two observers and the investigator. This procedure was recommended by Skindrud (1973) as a means of assessing interobserver agreement although in this case it was necessitated by the fact that the primary observer was unable to complete the study due to other job committments.

Reactivity of the Observation Process. Reactivity refers to the possibility that behavior may change when people realize that they are being monitored (Kazdin, 1982). Although reactivity is not inherent to behavioral observation (Kent, O'Leary, Dietz & Diament, 1979), there is general consensus that it occurs under some conditions (Haynes & Horne, 1982; Johnson & Bolstad, 1973) and that it can result in clinically significant effects and function as a confounding influence on the internal and external validity of a study.

Several authors have suggested procedures to be followed in order to minimize the impact of reactivity to observation. Given that the use of covert observation while preferable was not possible in this study the observers were instructed to be as unobtrusive as possible. They were to refrain from interacting with the subjects by avoiding eye-contact, supressing reactions or comments on activities or child performance. Also teachers were instructed to maintain their normal routines (Haynes & Horne, 1982) since no changes were required to accomodate the observation procedure. Also given the extended period of observations and the frequent occurrance of observations in this study, it is likely that the reactivity to the observation process would dissipate over time (Haynes & Horne, 1982).

Procedure for Data Collection

Data were collected on all students in a classroom for a continuous ten minute period commencing approximately every half hour. Data were collected over three hours of a school day. In order to maintain standardized measurement conditions each class was observed during the same time of day for all observations.

During the ten minute observation period the following procedure was followed. Each student was observed in sequence for thirty seconds. During that time any behavior which fitted into the catagories identified was indicated. Only one score per catagory was recorded within the thirty second observation. The observer listened to a pre-recorded tape which marked the thirty second intervals. Ear phones were used in order to minimize the obtrusiveness of the observation process.

Treatment of the Observational Data

Data from each classroom observation were aggregated across all students in the class. Data were organized to compute the information that follows.

1. The percent of the total intervals within the catagories of routine, one-to one, group, and freetime activities when students:
   a) were involved in activities,
   b) received direct instruction,
   c) received direction based on a written program,
   d) had their performance monitored through data collection.

2. The percent of the total intervals during which students were involved in functional activities.

3. The proportion of functional activities which were:
   a) age-appropriate,
   b) taught in context,
   c) used functional materials,
   d) contained components "a" through "c".

4. The percent of the total intervals which involved functional content as defined in number 3-d. This information was divided the catagories of routine, one-to-one, group, and freetime activities and rated in

terms of the levels of instructional intensity identified in number 1 (a through d).

5. The percent of functional activities which were taught in natural settings:

   a) in the segregated area of the school,
   b) in the intergrated area of the school,
   c) outside the school grounds

The data resulting from the above procedure were transcribed onto graphs and subjected to visual analysis (Parsonson & Baer, 1978). Once the data were plotted they were analysed for the following criteria: the stability of the baseline scores, the amount of overlap between scores, the variability of scores across and within phases and the adequacy of the number of data points within each phase (Kratochwill, 1978; Parsonson & Baer, 1978). The discussion and intrepretation of this information is found in Chapter Five.

The use of statistical procedures for analysing data from time-series experiments has been recommended by such authors as Glass et al. (1975). However the characteristics of visual analysis identified by Parsonson and Baer (1978) suggest that it is an appropriate method of analysis for the present study. These authors found that the use of visual analysis lowers the probability of inferring Type 1 errors or "erroneously rejecting the null hypothesis"(p. 111).

Jones et al. (1977) note that because visual analysis requires that the effects be of sufficient magnitude that they can be detected by observation, this method is considered to be more conservative than statistical analysis. This effect was demonstrated by Glass et al. (1975) who found that data judged not significant through visual analysis were found to be statistically significant.

The use of the less sensitive visual data analysis also means that the probability of a Type II error could be higher than is the case in studies employing statistical analysis (Parsonson & Baer, 1978). Type II error or accepting the null hypothesis when it should have been rejected may be more likely to occur because small effects may not show up as readily and are thus more likely to be dismissed as no effect (Baer, 1977). As noted by Parsonson and Baer (1978), Type II errors are less of a problem to scientific investigations since further studies are likely to reveal the presence of any actually effective variables.

Although visual analysis may be less sensitive to weak or unstable treatment effects (Glass et al., 1975), it was determined to be appropriate for use in this investigation. This decision was made because only treatment procedures which have sufficient power and generality to demonstrate clear and reliable changes in the plotted rates are acceptable as viable treatment procedures in applied settings where the conditions are sometimes less than ideal

(Parsonson & Baer, 1978). When treatment effects are demonstrated through these procedures they are likely to be of more clinical significance for those in applied settings than those for which effects are evident only through statistical analysis (Grigg, 1983).

Treatment

Observer Training and Reliability

Prior to the study, the observers received training on the observation form. The observers were initially instructed in the definitions of the different response catagories and then practised using the observation form in several classroom settings (one in which the teacher had previously received training and two other settings in which the teachers had not received the inservice training). During the training, reliability was taken continuously across observers until the mean reliability across observers exceeded a minimum criteria of 80 per cent over three consecutive observations. Collection of baseline data began once this standard had been reached.

During the study, reliability was checked at least once during each phase of the study for each subject. Two observers would simultaneously collect data on all children for at least three ten minute observation periods. Reliability was then calculated by dividing the number of agreements by the total number of agreements plus

Table 1

Interobserver Reliability Percentages

Subject/Week	No. of Observations	Activity Category	Level of Instruction	Functional	Age-Appropriate	Functional Materials	Context of Instruction	Instructional Location
A/2	50	96	84	90	87	90	87	97
A/14	42	94	82	93	84	86	84	98
A/21	40	94	70	92	92	86	81	94
B/5	52	87	84	88	83	90	88	95
B/22	35	88	76	100	94	88	94	98
B/29	40	94	94	94	94	94	94	96
C/15	35	100	85	96	100	96	97	100
C/26	40	100	83	100	100	96	96	100
C/28	35	100	86	94	100	100	97	100
D/17	38	100	95	88	85	95	88	100
D/23	36	90	80	90	100	95	81	95
Mean Across Subjects		94.8	83.5	93.1	92.6	92.3	89.7	97.5
Range		84 - 100	70 - 95	88 - 100	84 - 100	86 - 100	81 - 97	94 - 100

disagreements for each variable on the form. Reliability checks were scheduled across different subjects and across all combinations of observers. Table 1 contains information concerning interobserver reliability scores throughout the study.

Although ideally covert assessment of interobserver reliability should be employed (Kazdin, 1982), this procedure was not possible in the present study. As a result it is possible that observer awareness of reliability assessment may have led to higher levels of accuracy than would have been characteristic of sessions in which reliability was not assessed (Romanczyk, Kent, Diament, & O'Leary, 1973). Also Kent, O'Leary, Diament, and Dietz (1974) found that reliability estimates tended to be higher when reliability was calculated by the observers rather than the experimenter. To avoid this difficulty, all reliability checks were done by one of the two graduate students involved in the project.

Teacher Training and Follow-up Observations

After five weeks of baseline, the Subject A attended the S.T.E.P. inservice training. The content of the training was discussed in Chapter Three. After seven weeks of baseline, the Subject B attended the inservice. Thirteen weeks after the teachers in classrooms A and B were trained, four weeks of baseline were begun in the classrooms of

Figure 2

Multiple Baseline Across Subjects

Subjects	Week of Observation																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Class A	B	B	B	B	B	+	-	T	T	*	*	T	-	T	-	-	-	T	T	-	T	T	-	#	-	-	T	-	-	T	-
Class B	B	B	B	-	B	B	B	B	+	*	*	-	T	T	T	T	-	T	T	T	-	T	-	#	-	-	T	-	T	-	-
Class C	-	-	-	-	-	-	-	-	-	*	*	-	-	B	B	B	-	+	-	T	T	T	T	#	-	T	-	T	T	-	T
Class D	-	-	-	-	-	-	-	-	-	*	*	-	-	B	B	B	B	+	-	-	-	T	T	#	-	-	T	T	T	T	T

B = Baseline

+ = Teachers at inservice

T = Treatment observations after inservice

* = Christmas Holidays

= Spring Break

- = Missing Observations

Subjects C and D. Following this Subjects C and D attended the inservice. Figure 2 contains a schedule of classroom visitations and treatment interventions.

At the close of the inservice the teachers were requested to begin implementing the techniques presented during the week in their respective classrooms. A follow-up visit by one of the inservice presenters was scheduled to occur approximately three weeks after training to answer any staff questions or concerns and to monitor the implementation of the strategies presented during the inservice. Positive feedback was given to the staff on their effective use of the techniques presented during the inservice.
Modelling of the correct method of implementing the strategies was used if the staff was having difficulty.

After the first visit, at least two further visits were scheduled to provide intermittent feedback to the classroom staff on their proficiency in using the various strategies. Classroom teachers were also encouraged to contact the inservice personnel to request additional assistance questions or concerns.

Internal and External Validity

Internal Validity

"Internal validity refers to the degree of certainty that manipulation of the independent variable is responsible for the observed changes in the dependent variable" (Kratochwill, 1978, p. 11). It is a basic minimum without which the results of time-series experiments would remain uninterpretable (Campbell & Stanley, 1966). However the lack of control of many extraneous variables that is inherent in naturalistic research makes it difficult to maximize the internal validity of such research (Glass et al., 1975; Kratochwill, 1978). A discussion of possible threats to internal validity and steps taken to control these influences follows.

History.

History refers to any event (other than the intervention) occurring at the same time as the intervention that could influence the results or account for the pattern of data otherwise attributed to the intervention (Kazdin, 1982). Historical confounding is a major problem in time-series investigations since such studies extend over a long period of time. This fact makes the probability of an event extraneous to the treatment higher than in other types of designs (Kratochwill, 1978). The use of a multiple baseline design (Baer et al., 1968) helps eliminate this threat because experimental control is repeatedly demonstrated through the sequential introduction of treatment across subjects (Kratochwill, 1978).

Maturation.

This is defined as any physical and/or psychological change over time that may result from changes within the subject (Kazdin,1982; Kratochwill,1978). The threat to internal validity is that these changes may affect the subject's performance on the dependent variables. It has been noted by Parsonson and Baer (1978) that this potentially confounding influence can be minimized by careful analysis of trends in the baseline data. An extended baseline period for some subjects would facilitate this analysis. While it would have been preferable to have more overlap paricularly between subjects three and four and the first two subjects, this arrangement was not possible due to circumstances beyond the control of the experimenter. The significance of this influence will be discussed in Chapter Five.

Testing.

A confounding effect due to testing results when the process of measurement itself is a stimulus for change (Kratochwill, 1978). This tends to be more of a problem in between-group research than in single subject design (Kazdin, 1982). Also as previously mentioned, precautions were taken to minimize the reactive effects of the observational process.

Instrumentation.

Threats from this source are related to any change that takes place over time in the measurement or the assessment procedure (Kazdin,1982). This threat is of particular concern when data is collected by human observers (Kratochwill, 1978). Here again, as noted earlier in this chapter, precautions were taken in the design and in the observational methodology in order to avoid such problems as observer bias, drift or reactivity caused by the observation process.

Instability.

Kratochwill (1978) notes that there is some degree of variability that typically occurs when repeated measures are taken on subjects over time. When this variability is large it is difficult to determine whether the observed changes are due to the intervention or are part of the naturally occurring variability. The impact of this factor in interpreting the data will be discussed in Chapter Five.

Selection Biases.

This threat refers to confounding that results from differential subject selection (Kazdin, 1982). This problem typically occurs when already formed groups are used in a study (Kratochwill, 1978). It arises from the fact that the groups may be different on some relevant dimension before the study begins. The effect of this factor will be discussed in Chapter Five.

Reactive Interventions.

This threat arises in situations where the investigator introduces the intervention as a reaction to a previous or impending change in the data (Kratochwill, 1978). In the present study the baseline and intervention phases were predetermined by individuals other than the experimenter. Thus, there could be no deliberate attempt to begin intervention at a time when the data were favourable.

External Validity

External validity refers to the extent to which the findings from a specific study can be generalized across other subjects, settings and therapeutic agents (Kratochwill, 1978; Kazdin, 1982). External validity can involve population-sample considerations as well as environmental influences (Kratochwill, 1978). A major limitation of single subject designs is the difficulty of generalizing the results to subjects not involved in a particular experiment (Herson & Barlow, 1976). A discussion of the factors which may affect the external validity of this study follows.

Generalization Across Subjects.

Even though the findings of a study may be internally valid, they may not be generalizable to subjects whose characteristics may differ from those included in the study (Kazdin, 1982). Although the majority of students' in the study were classified as dependent handicapped, the heterogeneity of this population precludes the possibility of matching subject variables.

However, since the dependent handicapped population is typically heterogeneous, the evaluation of the data across four classrooms of students increases the generalizability of the data to the population of interest (Grigg, 1983). Hersen and Barlow (1976), concur that an appropriate method of increasing the base for generalization is to repeat the study several times across different subjects.

Generalization Across Settings.

In order to encourage the generalization of the results to more than one setting the study was systematically replicated in four different classrooms (Kazdin, 1982). Each of these classrooms differed in the number of students, number of staff, hours of operation, and age of students.

Generalization Across Therapeutic Agents.

Although the settings did vary, the inservice personnel who delivered the S.T.E.P. Inservice and participated in the follow-up consultation were held constant across all subjects. Therefore, it would be difficult to generalize these findings across other inservice personnel or inservice packages.

Explicit Description of the Independent Variable.

A comprehensive description of the independent variable and the method of the presentation was included in Chapter two. A review of this description of the S.T.E.P. training can provide the necessary information to estimate the degree with which the findings can be generalized to other settings (Kratochwill, 1978).

Hawthorne Effect.

It is possible that a subject's knowledge that they are participating in an investigation can alter their responses to the interventions (Kratochwill, 1978). If their responses are significantly altered, the generalization of the effects of the intervention to subjects who do not have this knowledge will be questionable (Bracht & Glass, 1968). It is possible that the behavior of the classroom staff could be influenced for this reason. In order to minimixe this possibility, observers were instructed to be as non-obstrusive as possible. Also, the extended time period during which the observers were in the classrooms may have increased the comfort level of the staff and encouraged more natural behavior.

Novelty and Disruption Effects.

Kratochwill (1978) suggests that the introduction of an unusual or novel intervention can cause an effect which occurs as a function of novelty phenomena which can become absent as the intervention progresses. In addition, the intervention can cause disruption in the normal classroom routine rendering the intervention less effective during the initial phase of the study (Kratochwill, 1978). Given the extented period of time of this study, this factor should have minimal effect on the validity of the study.

Experimenter Effects.

It has been suggested that the experimenter and/or observers can intentionally or unintentionally affect the subject's behavior so that the intervention does not generalize to other experimenters and/or observers (Kratochwill, 1978). Precautions were taken to reduce observer bias by not discussing the trends in the data or giving specific feedback to the classroom staff on their improvement. The use of the same personnel during the inservice training and follow-up however, could limit the ability to generalize the results across different training staff.

Interaction of History and Intervention Effects.

The use of a multiple baseline design across subjects assists in controlling the confounding influence of historical variables. It is highly unlikely that when the treatment effects are replicated across subjects over time that in each case a particular historic event could be responsible for the occurring change (Grigg, 1983).

Measurement of the Dependent Variable.

In order to ensure that the operational definitions of the dependent variables remained intact, frequent inter-observer reliability checks were made.

Interaction of Time of Measurement and Intervention Effects.

The use of a multiple baseline across subjects design increases the ecological validity of an investigation since the results of the treatment effect are demonstrated over time (Kratochwill, 1978).

Presentation of the results of the present study will occur in Chapter Six, with the discussion of these results following in Chapter Seven.

Chapter VI

RESULTS

The results of this study will be addressed in three sections reflecting the general areas addressed by the research questions. The first section containing questions one through five is concerned with the amount of student involvement and the level of instructional intensity without regard to the functionality of the content of the activity. Questions six and seven address issues regarding the extent to which functional activities meet specified qualitative standards. The final section addressed by questions eight to thirteen discusses the extent to which students are involved in functional activities which meet all qualitative standards specified in the study. It also addresses the instructional intensity of this involvement.

The results of this investigation are represented graphically in the order of the research questions posed to evaluate the effects of the STEP Inservice Training Program.

The treatment effects seen across subjects are briefly described and common behavior patterns identified. The data are analysed visually for the following criteria: the stability of the baseline scores, the amount of overlap between scores, the variability of scores across and within phases and the adequacy of the number of data points within each phase (Kratochwill, 1978; Parsonson & Baer, 1978). A more detailed discussion of the differential responses to the treatment found across subjects is presented in Chapter Seven.

Research Question 1

As a result of training, was there a significant increase in the percent of intervals during routine tasks when students

a) were involved in activity,

b) received direct instruction,

c) received instruction based on written programs,

d) had their performance monitored through data collection?

Visual analysis of the graphic data presented in Figures 3 indicates that there was no change in student involvement in routine activities. Subjects B, C, and D showed a decreasing trend during baseline in the amount of student involvement in routine activities. Post treatment scores suggested a stabilization in student involvement in routine activities for all subjects at levels approximating the baseline range. Subjects B and C demonstrated periods of increase which declined to baseline rates toward the end of the study.

The data revealed increases in the percent of intervals during which students received direct instruction during these activities for Subjects A, B, and C.

Figure 4 indicated that Teachers A and B showed clear increases in the percent of formal instruction based on written programming while no change was found in subjects C and D. For the majority of the subjects there was no increase in the percent of intervals during which data were collected. Only subject B demonstrated an increase in this area.

Figure 3
Instructional Intensity in Routine Activities

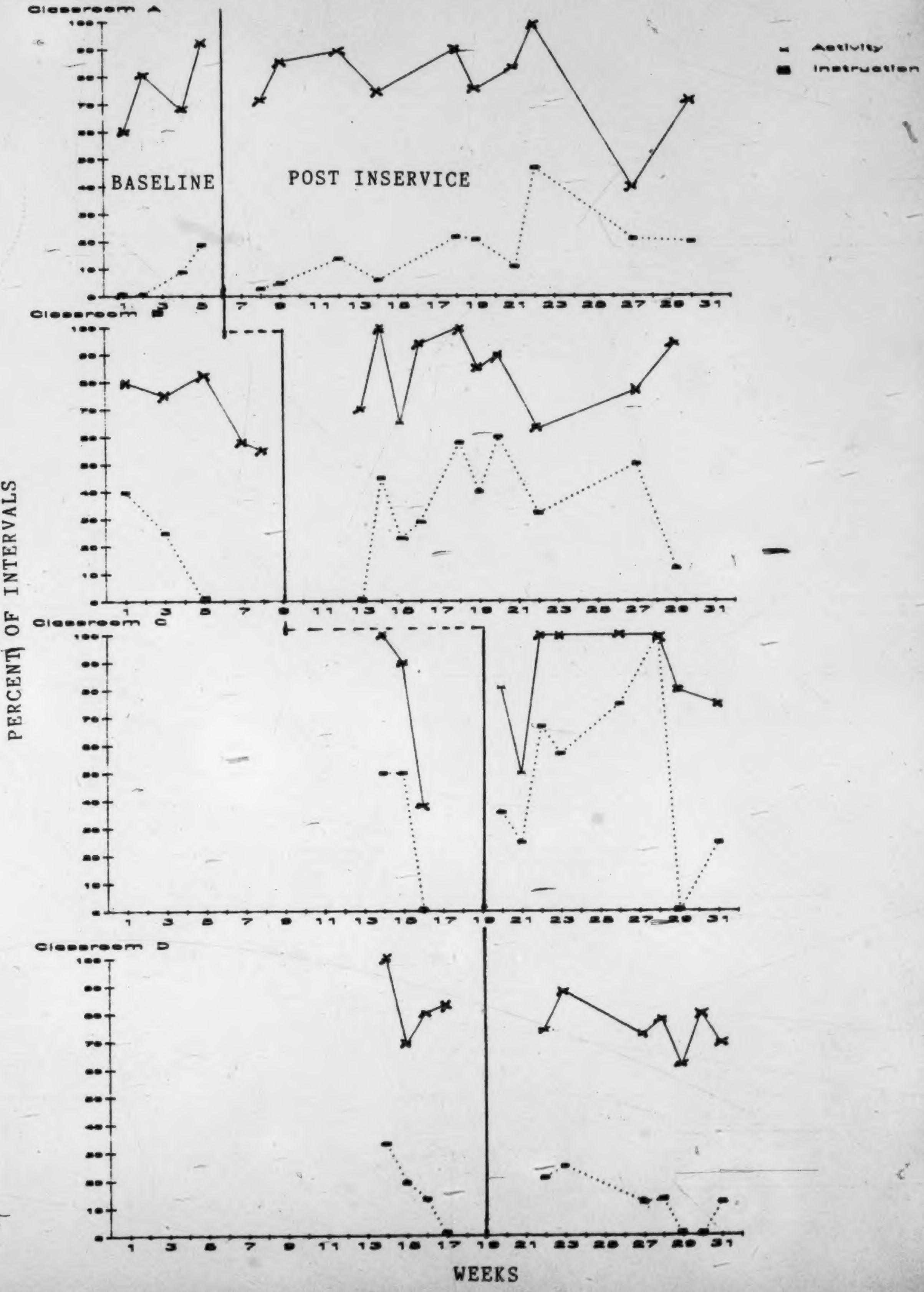
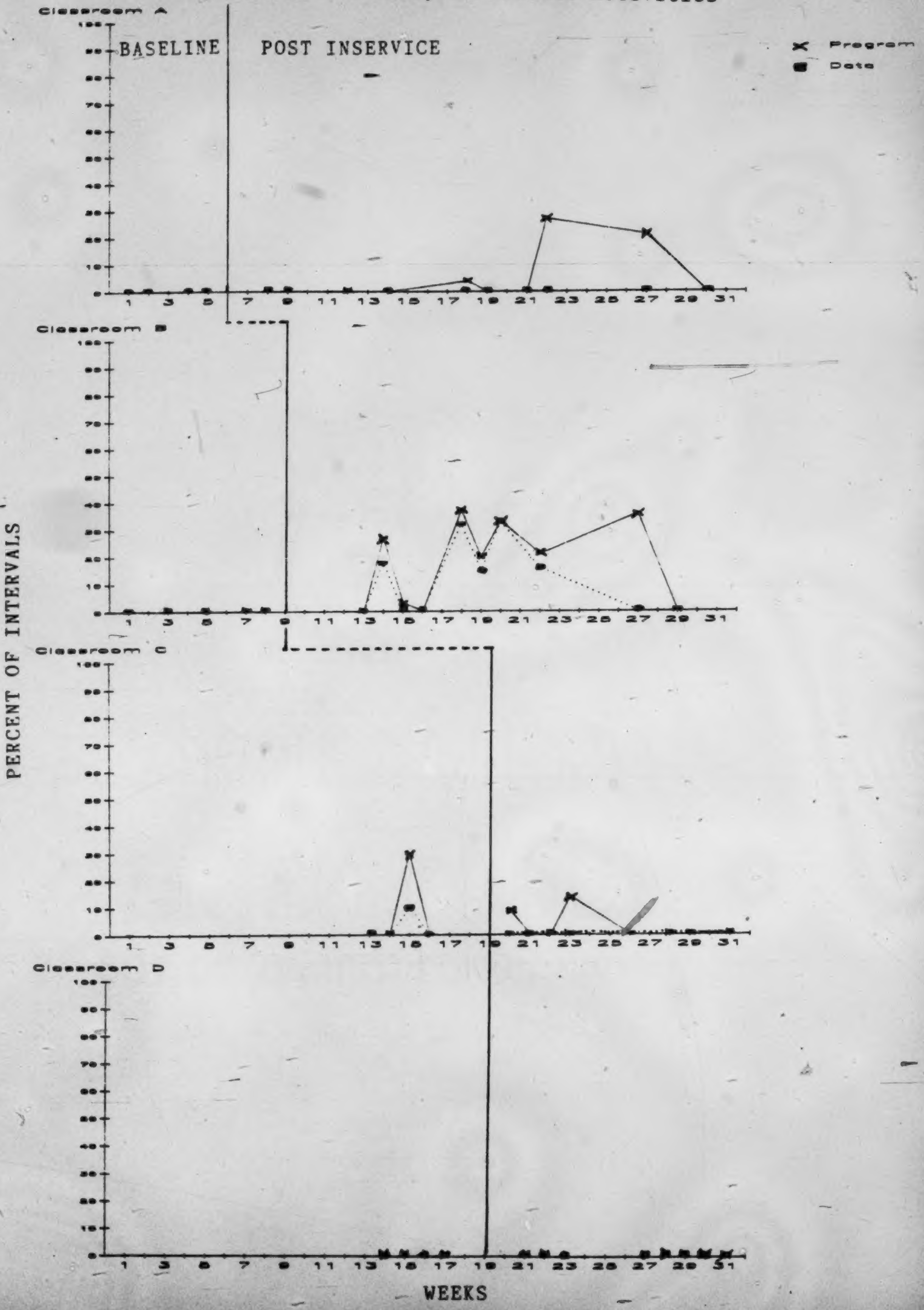


Figure 4
Instructional Intensity in Routine Activities



Research Question 2

As a result of training, was there a significant increase in the percent of intervals during one to one activities when students

a) were involved in activity,

b) received direct instruction,

c) received instruction based on a written program,

d) had their performance monitored through data collection?

The data presented in Figure 5 indicate that there was no significant increase in student involvement in activities in one to one situations. This was not unexpected due to the nature of the one-to-one situation reflected in the high baseline levels that existed for all subjects. An increase in the percent of intervals in which students received instruction occurred for Subjects A and B. While no increase was demonstrated by the other two subjects.

Figure 6 revealed an overall increase in the percent of written programs used by Subjects A and B although treatment scores overlapped with baseline performance levels. Subjects C and D initially showed no change over baseline levels. A visual analysis of the trends in the data suggests a pattern of continuity across all subjects between baseline and post-treatment scores in relation to the use of written programs. For all subjects the use of written programs tended to decrease toward the end of the study.

Sporadic increases beyond baseline levels in data collection were observed in Subjects A and B. Use of data decreased in subjects C and D.

Figure 5
Instructional Intensity in Individual Activities

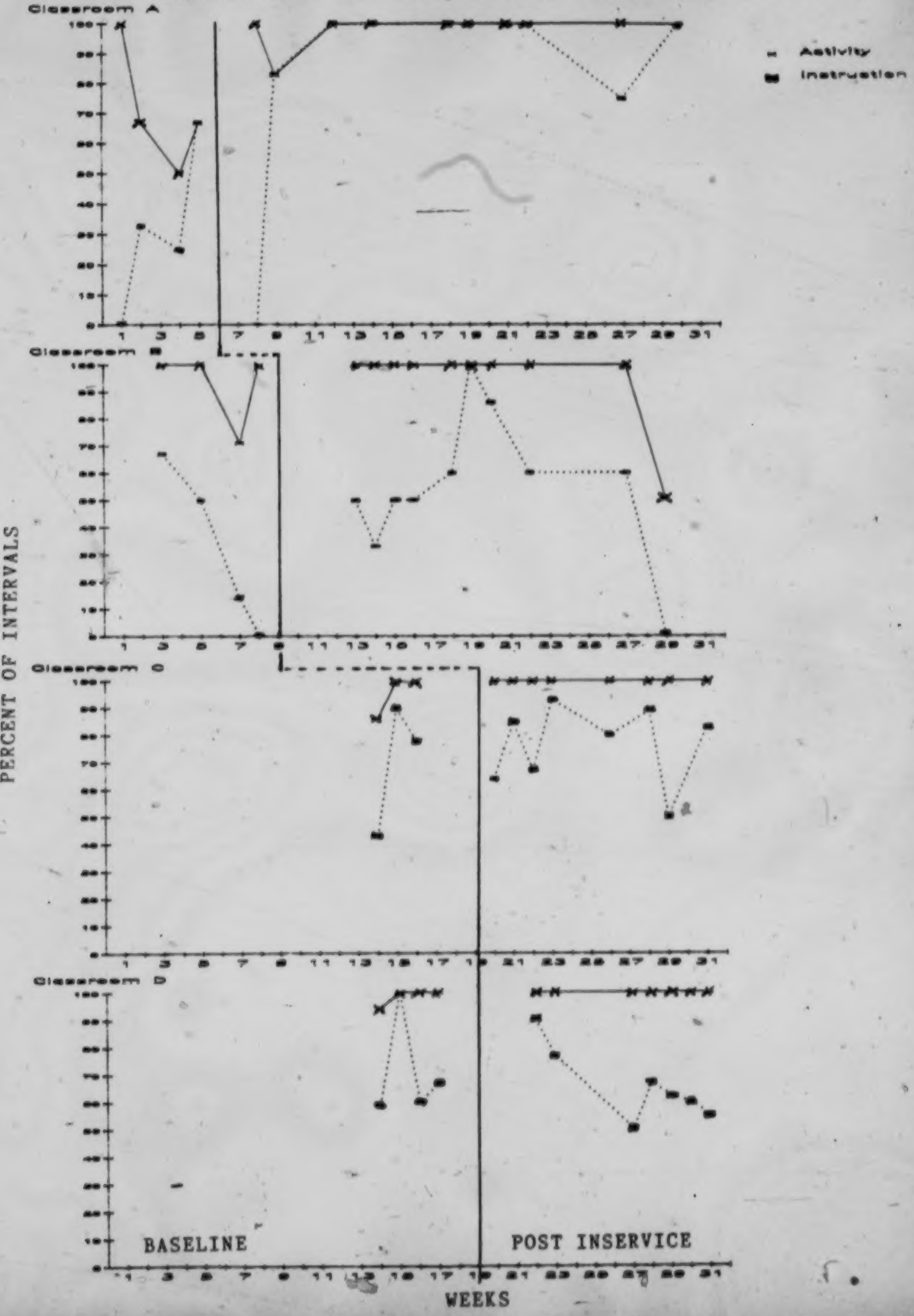
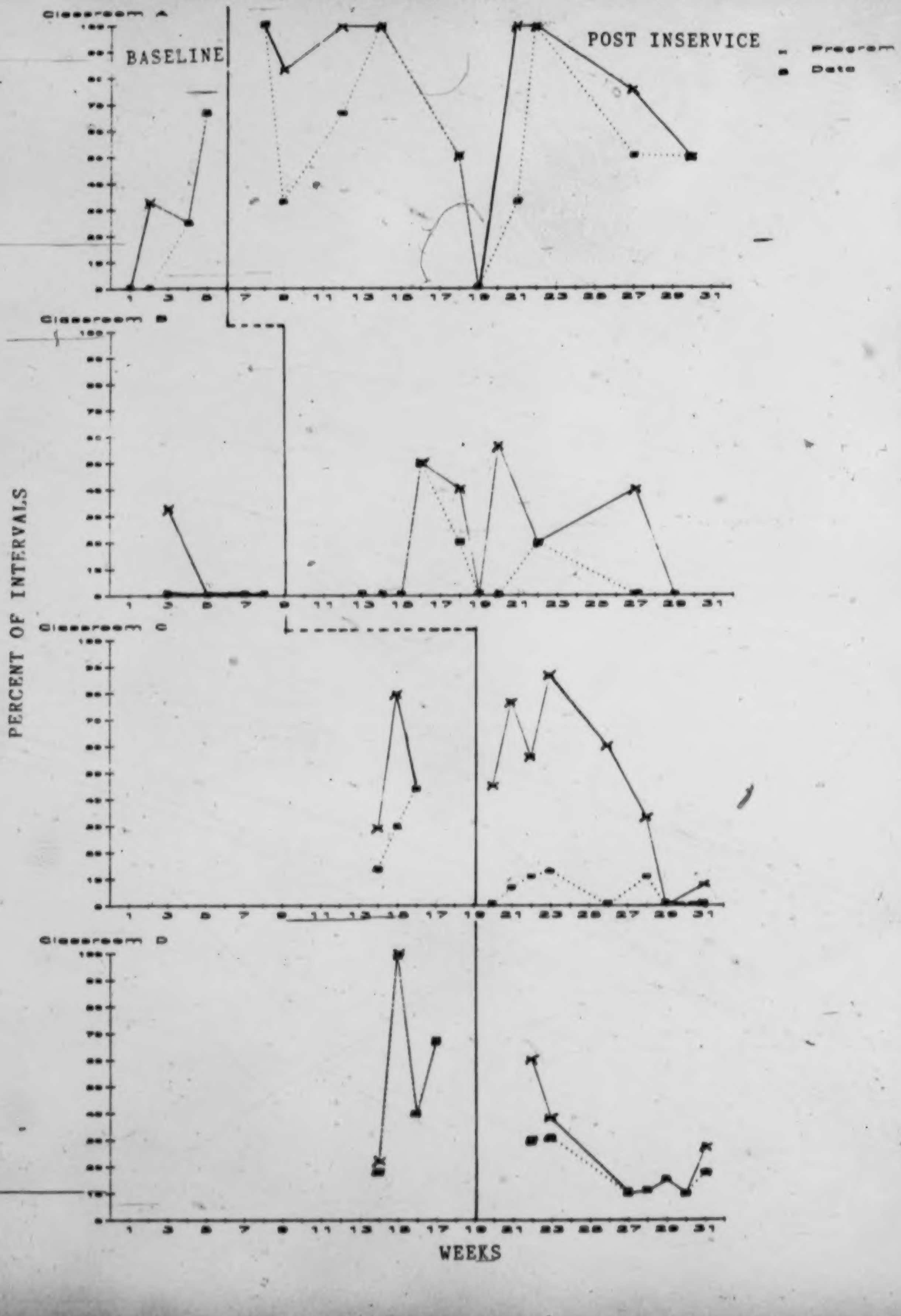


Figure 6
Instructional Intensity in Individual Activities



Research Question 3

As a result of training, was there a significant increase in the percent of intervals during group activities when students

a) were involved in activity,

b) received direct instruction,

c) received instruction based in a written program,

d) had their performance monitored through data collection?

The data presented in Figures 7 and 8 indicate no increase in the student involvement in group activities. Similarly no stable increases were observed in the use of direct instruction or written programs. Only Subject A showed an increase in the use of data collection to monitor student progress in group activities.

Figure 7
Instructional Intensity in Group Activities

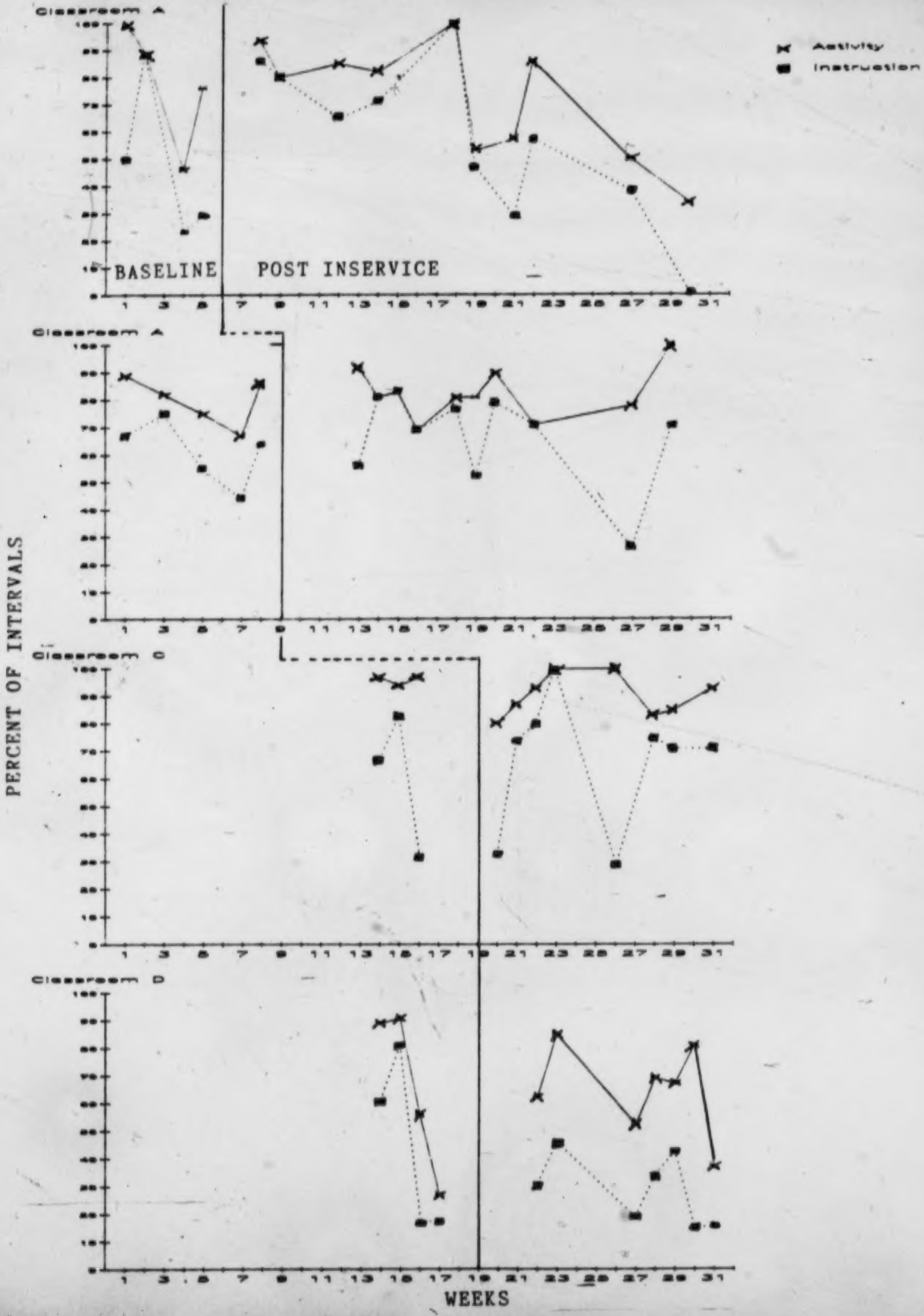
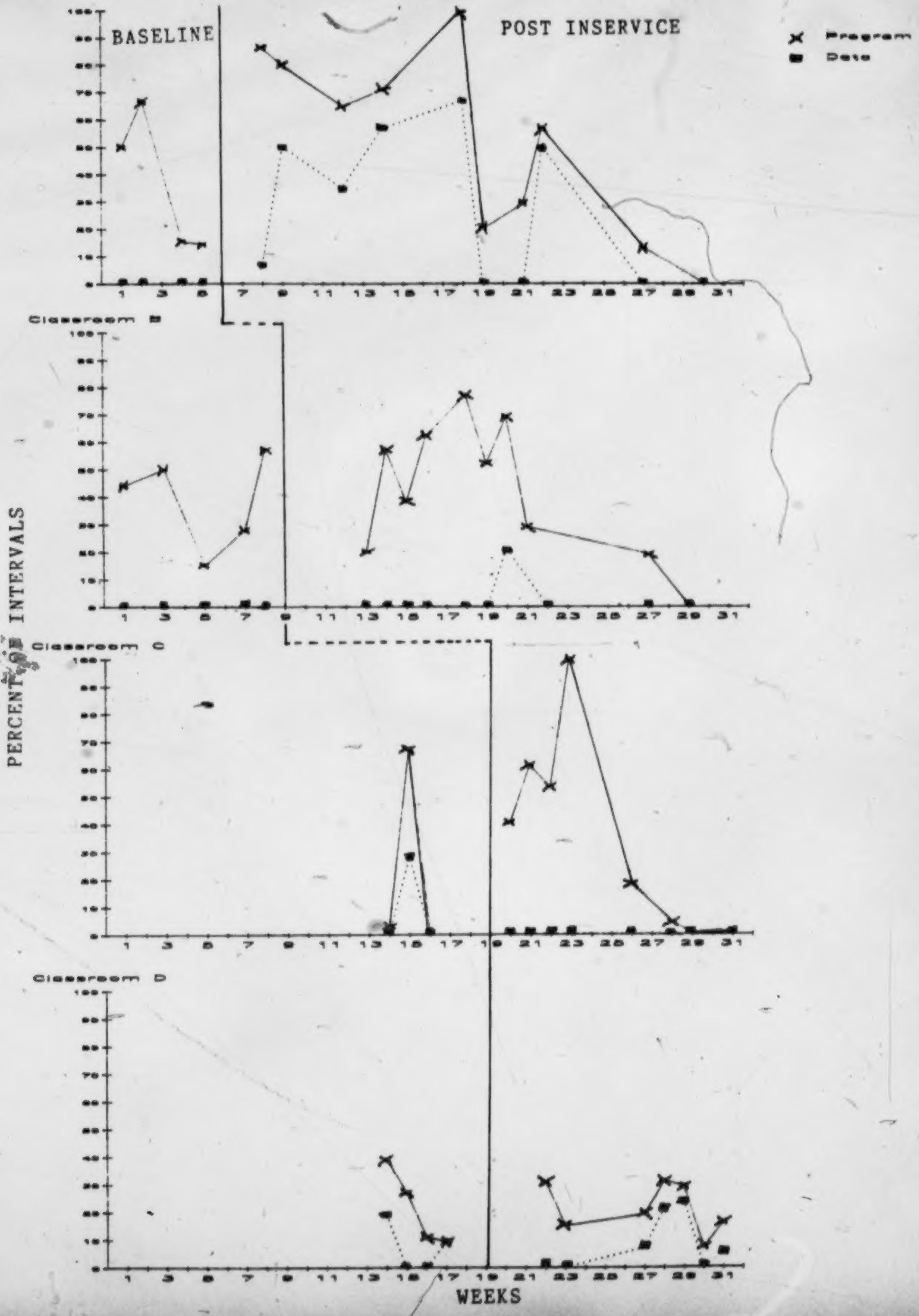


Figure 8
Instructional Intensity in Group Activities



Research Question 4

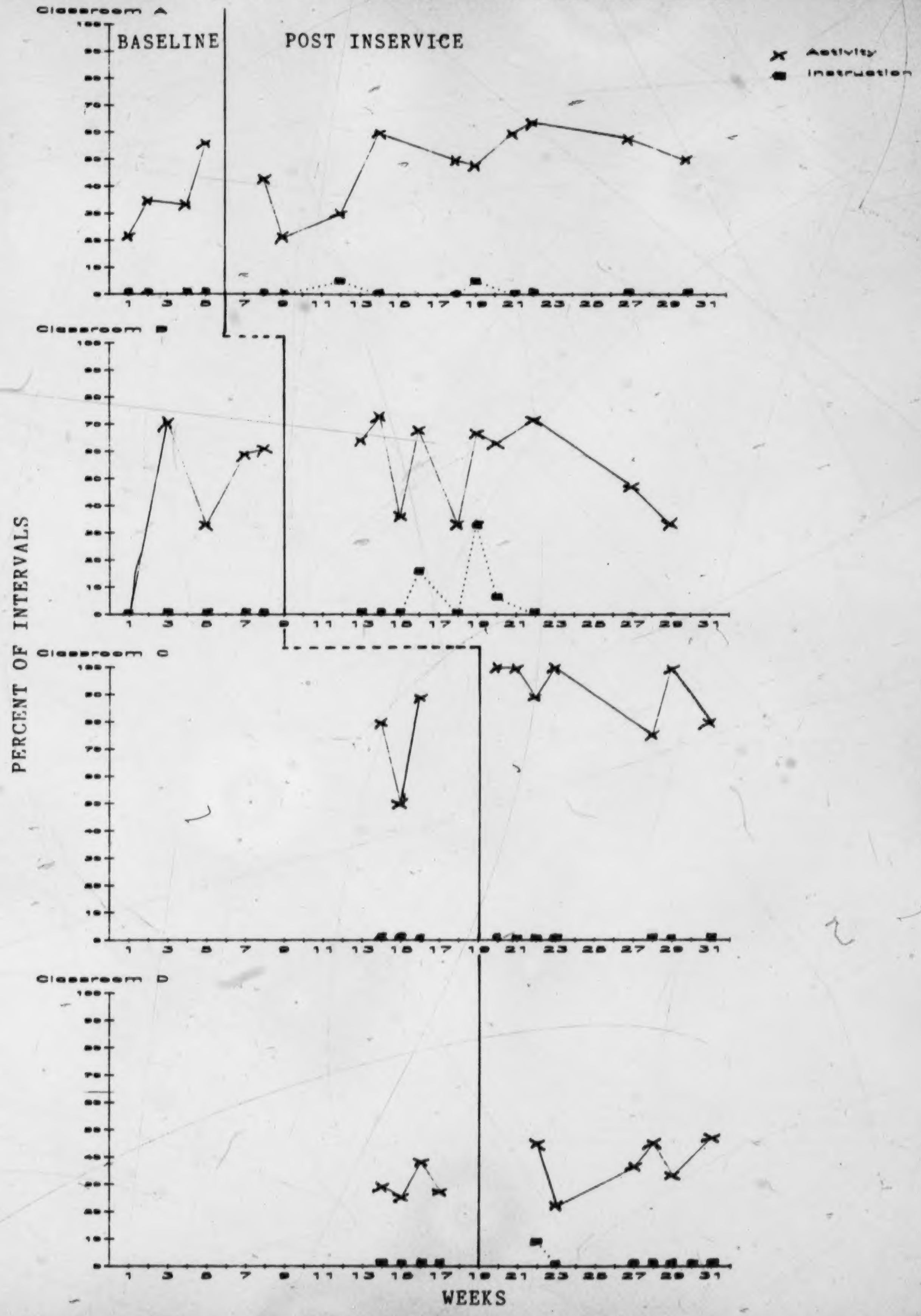
As a result of training, was there a significant increase in the percent of intervals during freetime activities when students

a) were involved in activity,

b) received direct instruction?

Observations of all subjects indicated a trend toward an increase in student involvement in activities during baseline. The results, depicted in Figure 9 indicated that although there was a slight increase in student involvement in freetime activities in the classrooms of Subjects A and C following participation in the inservice there is evidence in all subjects of a continuity between baseline and postreatment levels of student involvement. No trend toward an increase in percent of instruction was demonstrated although sporatic increases were observed in all subjects.

Figure 9
Instructional Intensity in Freetime Activities



Research Question 5

As a result of training, was there a significant increase across all activities in the percent of intervals students

a) were involved in activities,

b) received direct instruction,

c) received instruction based on a written program,

d) had their performance monitored through data collection?

Visual analysis of the data in Figures 10 and 11 indicates no overall tendency towards an increase in student involvement in activities across subjects. Similarly no significant increase in direct instruction was evident.There was no general increase in the use of written programs. Only Subject A showed a stable increase in the use of written programs while Subjects A and B evidenced slight increases in the collection of data. Subjects B, C, and D all showed initial increasing tendencies in the use of formal programming immediately following training but this was followed by a decline to baseline levels.

Figure 10
Instructional Intensity Across all Activities

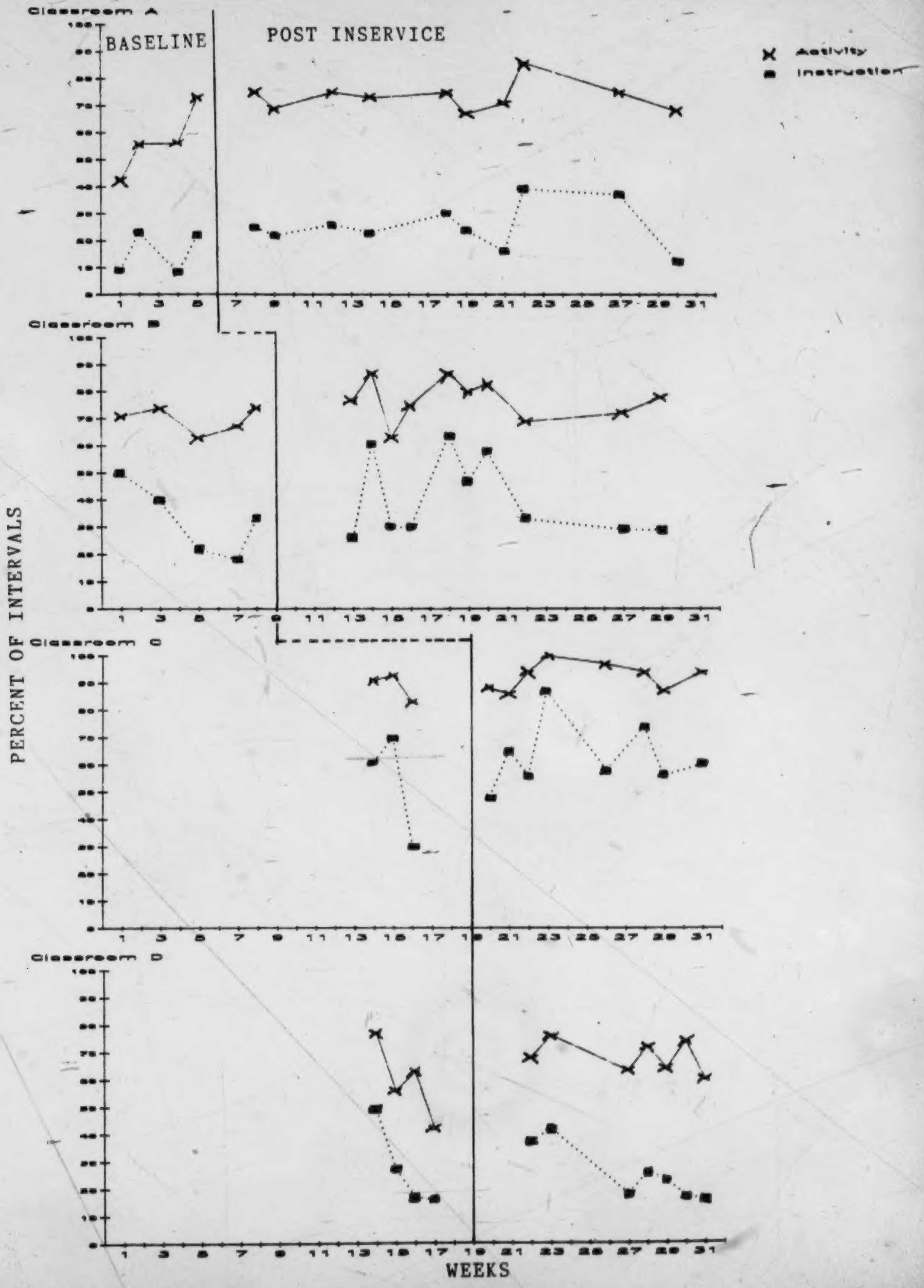
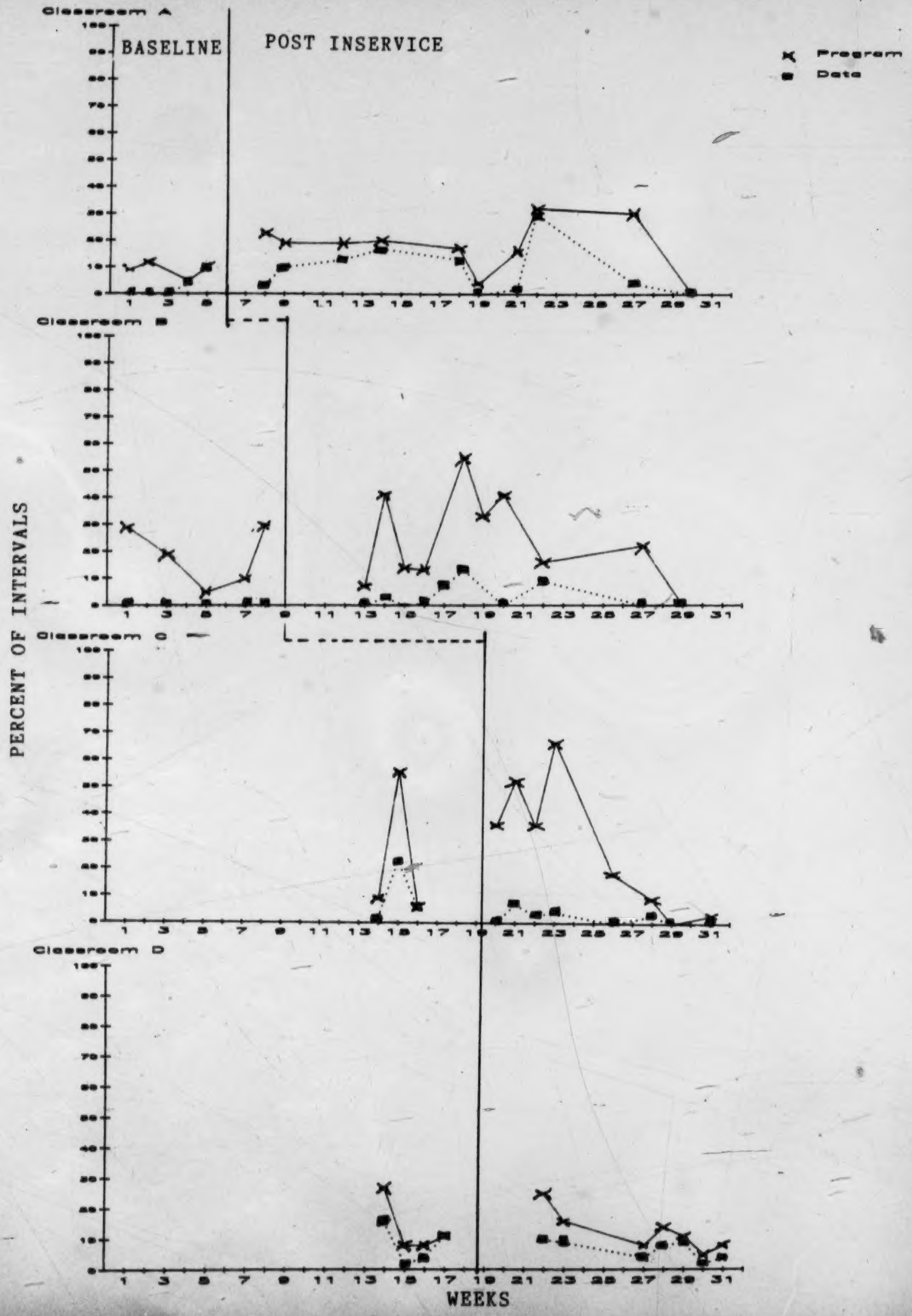


Figure 11
Instructional Intensity Across All Activities



Summary of Results For Questions One to Five

The questions in this section of the study investigated absolute changes in the amount and intensity of instruction without regard to the appropriateness of the content. That is, this section addressed issues related to quantity of instruction as opposed to quality of content. The results depicted in Figures 3 through 11 indicate no overall increase the total amount of student involvement in activities, frequency of direct instruction, or use of written programs. However, the data suggest some positive impact on the use of data collection for Subjects A and B.

Within the catagories increases occurred in routine activities with the majority of the subjects showing an increase in student involvement and use of direct instruction.

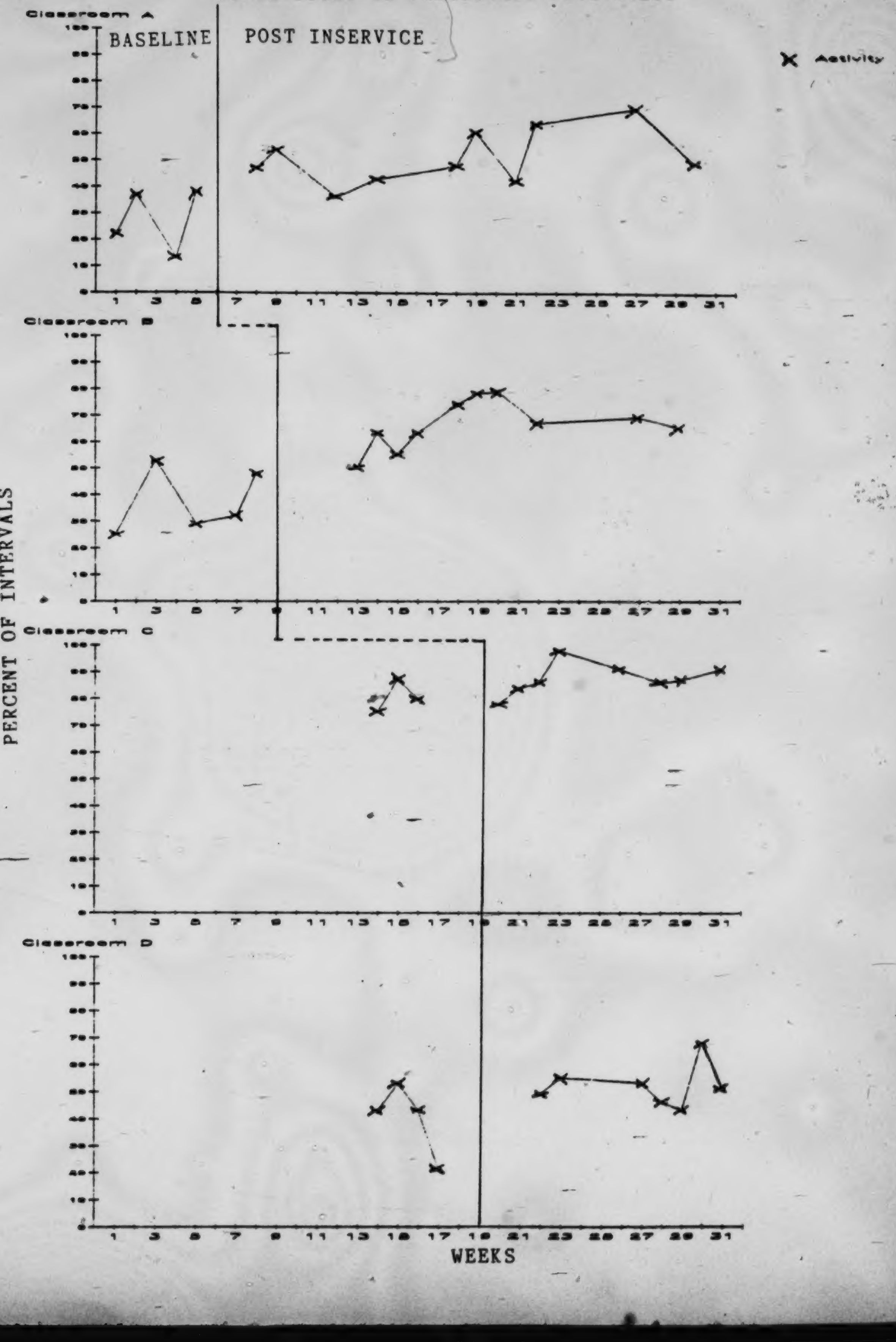
Mixed results were found within catagories suggesting an increase in the use of written programs in routine activities, the use of direct instruction, and written programs during individual instruction, and student involvement in freetime activities. In all but one case it was Subjects A and B who showed change in the desired direction.

Research Question 6

As a result of training, was there a significant increase in the percent of intervals students were involved in functional activities?

Figure 12 indicates an increase across all subjects in the percent of intervals during which students were involved in functional activities. The level of the increase was most pronounced in Subjects A and B where there was little overlap between baseline and post treatment scores.

Figure 12
Involvement in Functional Activities



Research Question 7

As a result of training, was there a significant increase in the percent of functional activities that

a) were age-appropriate,

b) used functional materials,

c) were taught in context,

d) contained all components (a-c)?

Figure 13 indicates a significant increase in the percent of functional activities which were age-appropriate for Subjects A and B. Although Subject D showed only a very slight increase in level, a change in trend in the desired direction was noted. No change was noted in Subject C. This was not unexpected given the high baseline scores and the fact that the difficulty of implementing age-appropriate curriculum content increases as students get older. In a preschool classroom it was anticipated that a high proportion of the content would be age-appropriate.

Figure 14 indicates that during baseline a very high percent of functional activities utilized functional materials. The post treatment data suggest a ceiling effect although slight increases in level were noted for Subjects A and B.

Figure 15 suggests no overall increase in the proportion of functional activities that occurred in context. Here again the majority of subjects showed high baseline levels. However, it should be noted that whether an activity is in context may, to some extent, be related to the level of instructional intensity. Low intensity instruction at the activity level is more likely to be in context than more intensive instruction utilizing formal written programming and data collection.

Figure 16 indicates that Subjects A and B implemented more functional activities containing all components following training. No increase was evident for Subjects C and D.

Figure 1[3]
Involvement in Age-Appropriate Functional Activities

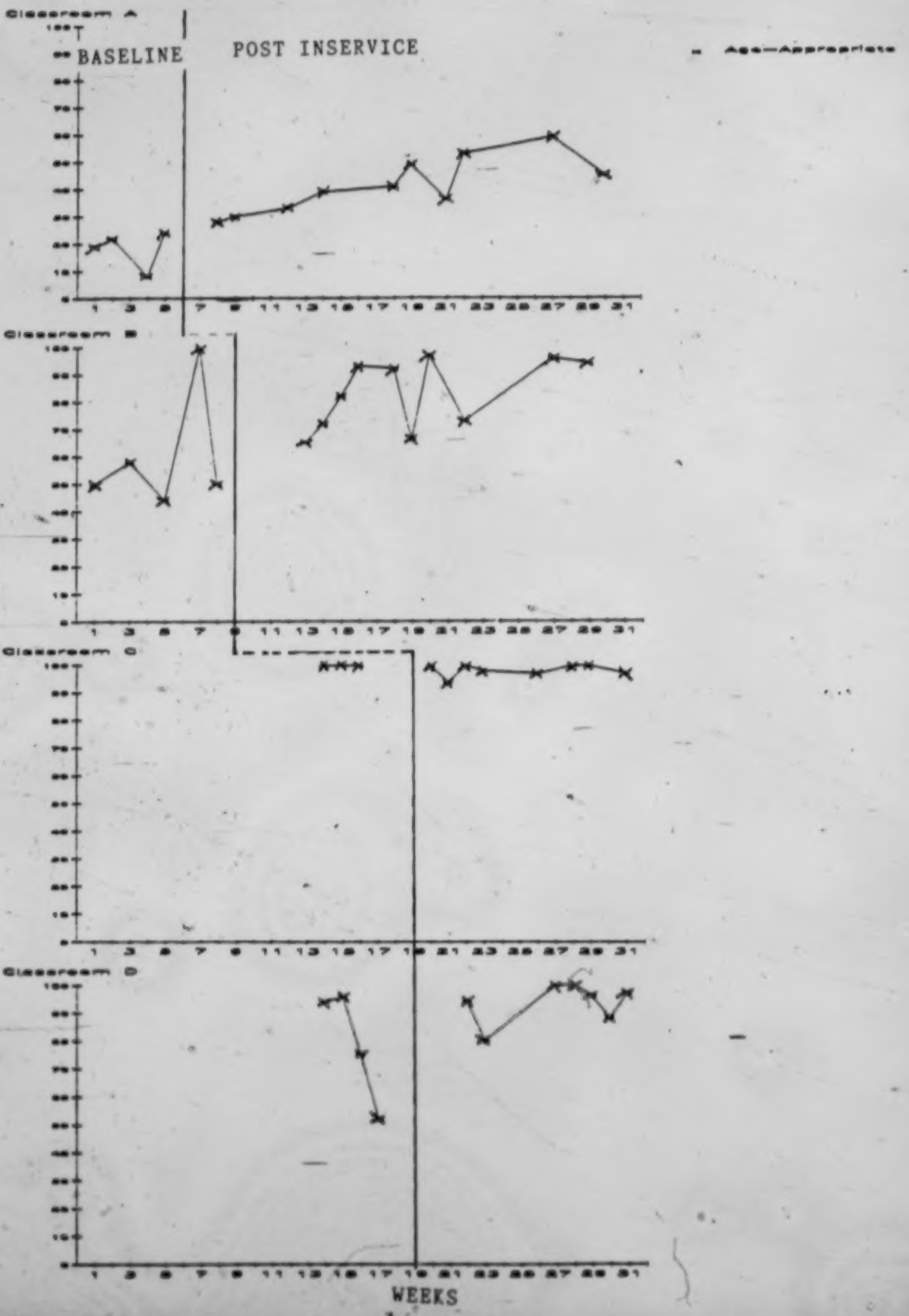


Figure 14
Use of Functional Materials

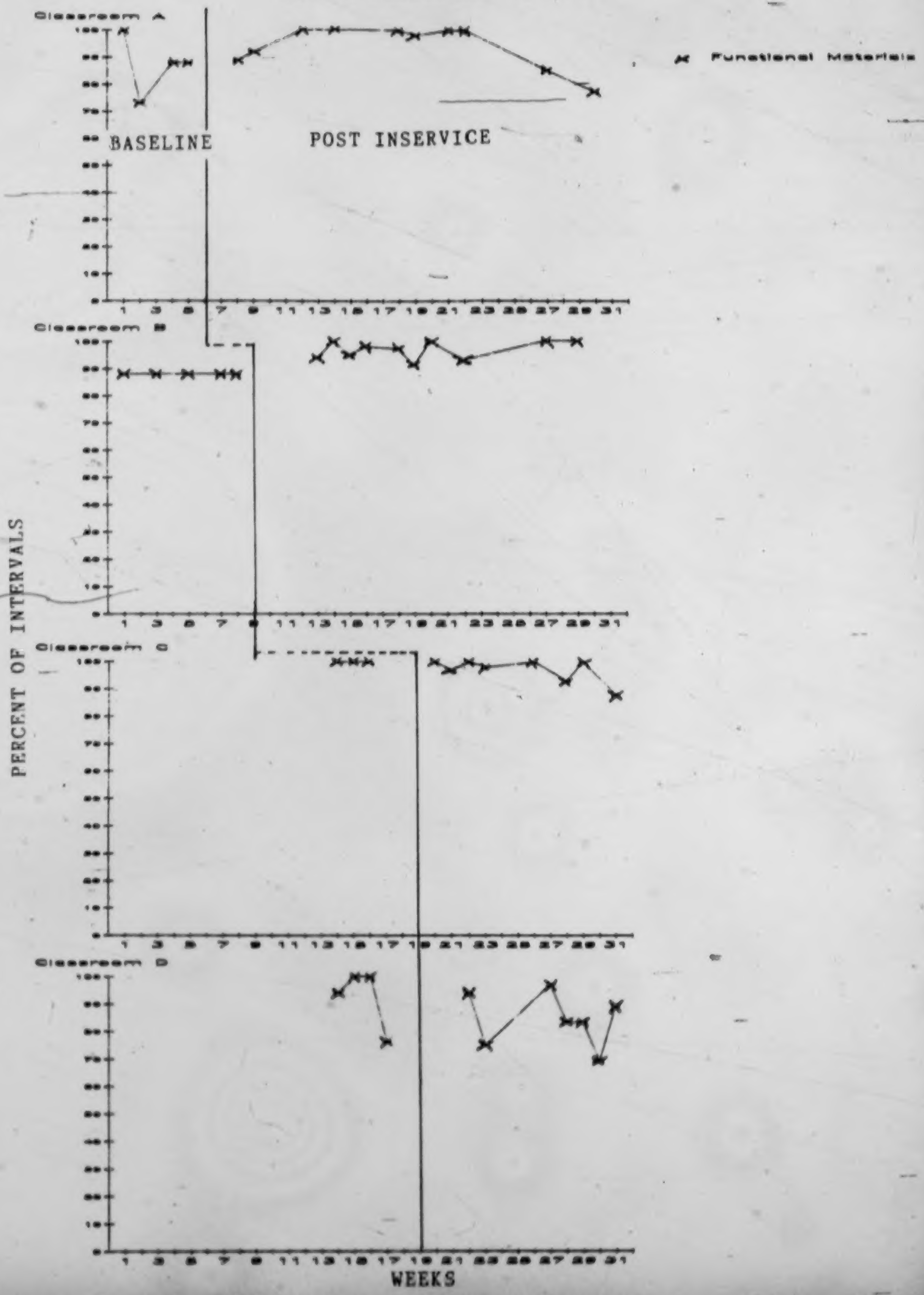
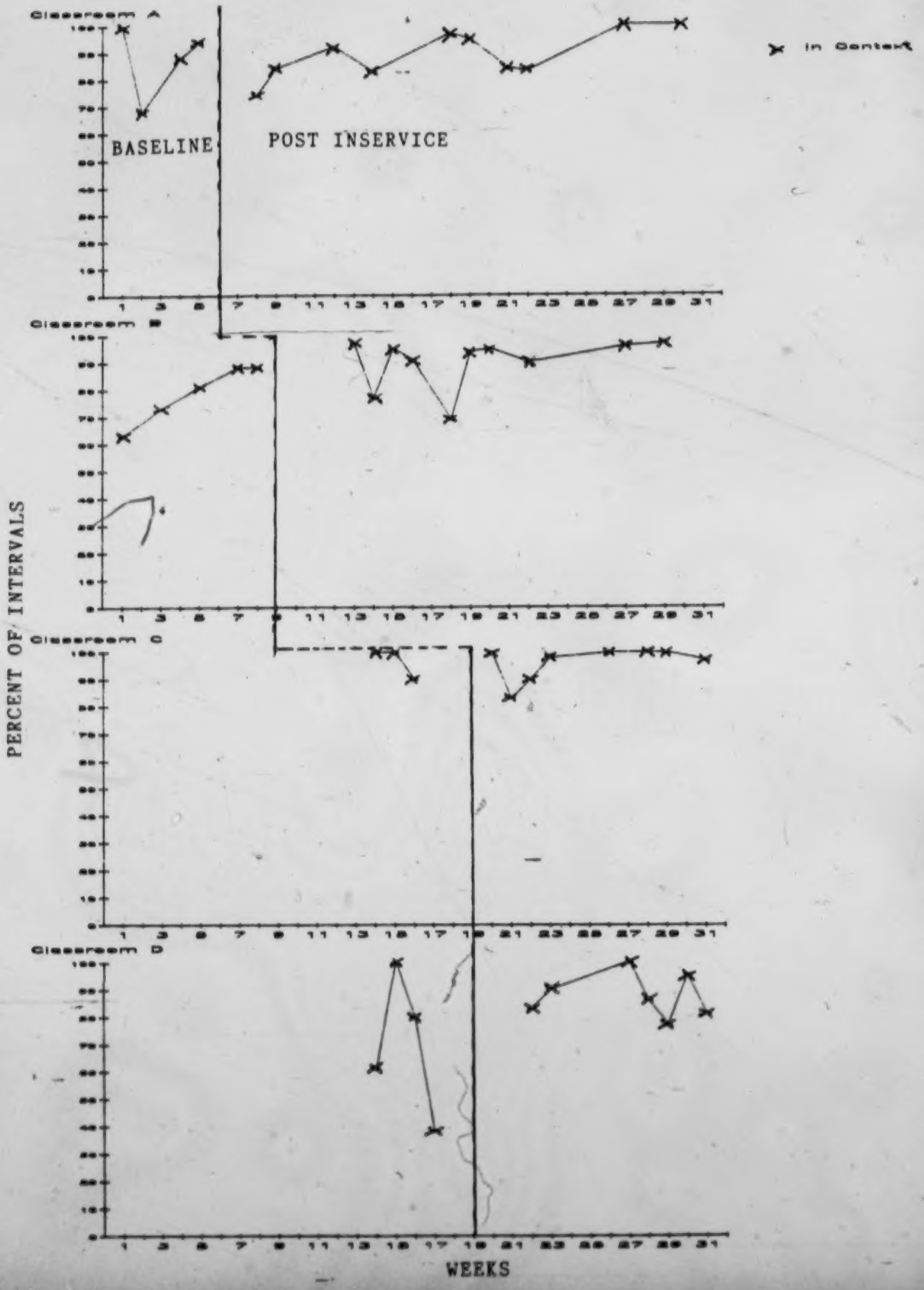


Figure 15
Participation in Functional Activities In Context



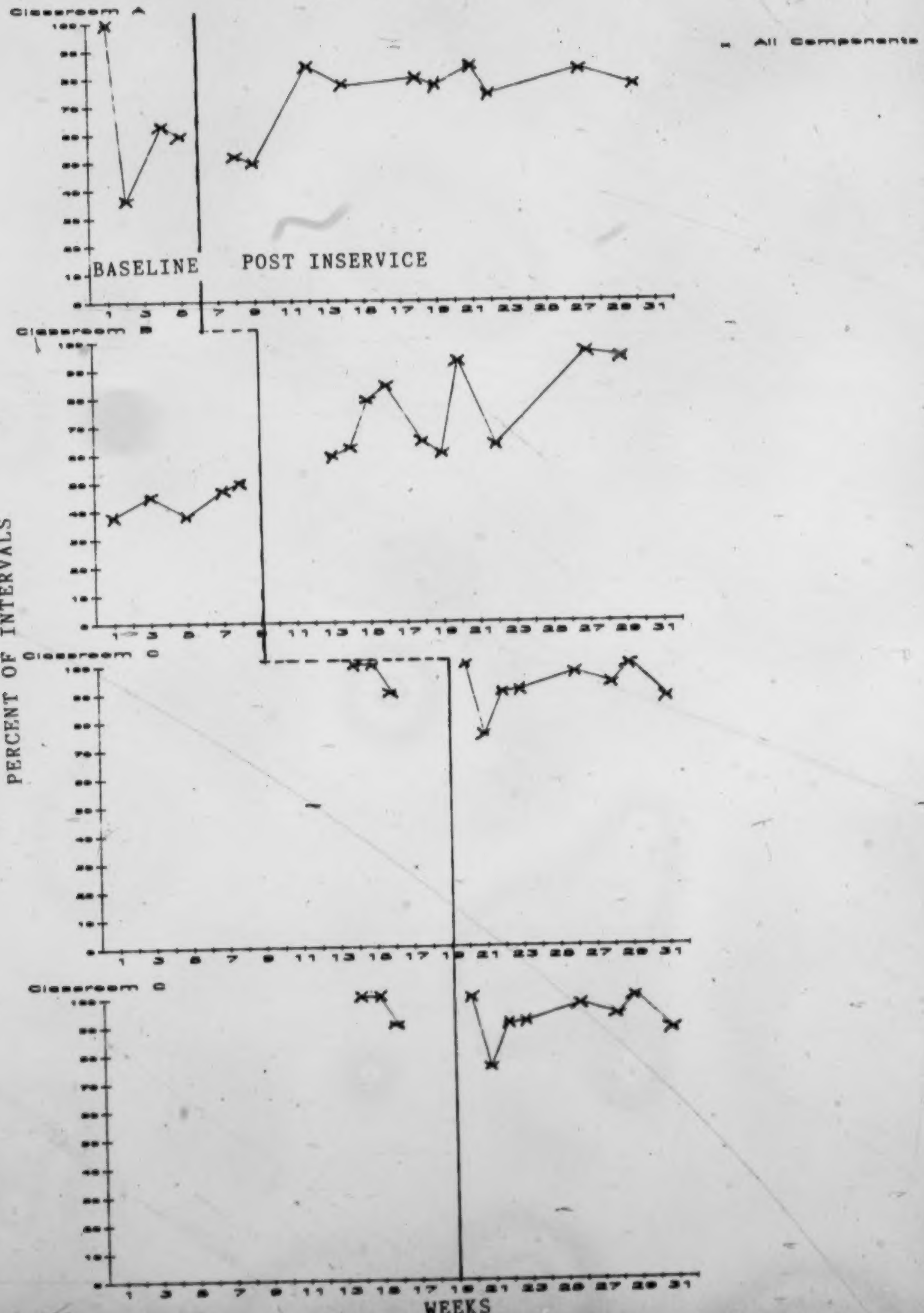


Figure 16
Functional Activities Containing All Components

Summary Of Results For Questions Six and Seven

The results of Research Questions 6 and 7 indicate that following participation students in all four classrooms were observed to be spending a higher percentage of intervals involved in functional activities. Following training three of the four subjects showed an increase in the proportion of functional activities which were age-appropriate. Generally no change in the percent of intervals during which students were involved in functional activities which used functional materials and were presented in context was evident. These later two criteria were at a high level during baseline.

Research Question 8

As a result of training, was there an increase in the percent of intervals during which students were involved in functional activities which occurred in the natural environment

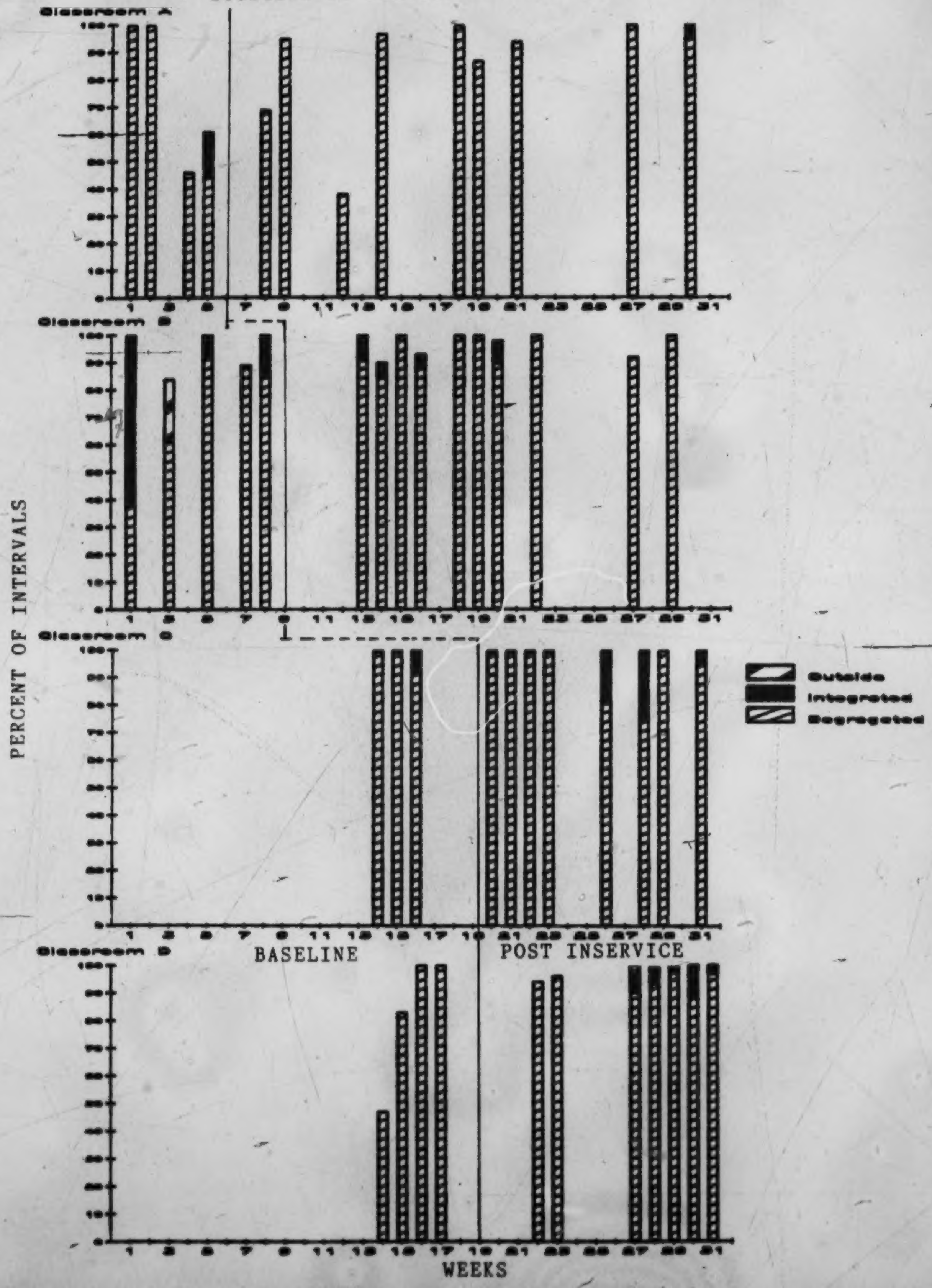
a) in the segregated area of the school,

b) in an integrated area of the school,

c) outside the school grounds?

Figure 17 clearly indicates that there was no change across subjects in the location where students were involved in functional activities. The high baseline scores indicate that prior to training most involvement in functional activities occurred in a natural context within the area of the school designated for the specific use of the severely handicapped students. No significant trend toward involving students in functional activities in integrated areas of the school or outside the school was demonstrated.

Figure 17
Location of Functional Activity



Research Question 9

As a result of training, was there a significant increase during routine tasks in the percent of intervals students were involved in functional, age-appropriate activities which used functional materials and were taught in context

a) at the activity level,

b) involving direct instruction,

c) involving instruction based on a written program,

d) in which performance was monitored through data collection?

Figure 18 indicates that subjects A, B, and C showed a slight tendency in the direction of an increase in the percent student involvement in functional activities containing all three components. These classes evidenced an even larger increase in the percent of direct instruction delivered during functional routine activities.

Figure 19 shows a significant increase by Subjects A and B in the use of systematic instruction based on written programs for teaching functional activities occurring during routine tasks. No significant increase in data collection was noted.

Figure 18
Involvement in Functional Routine Activities

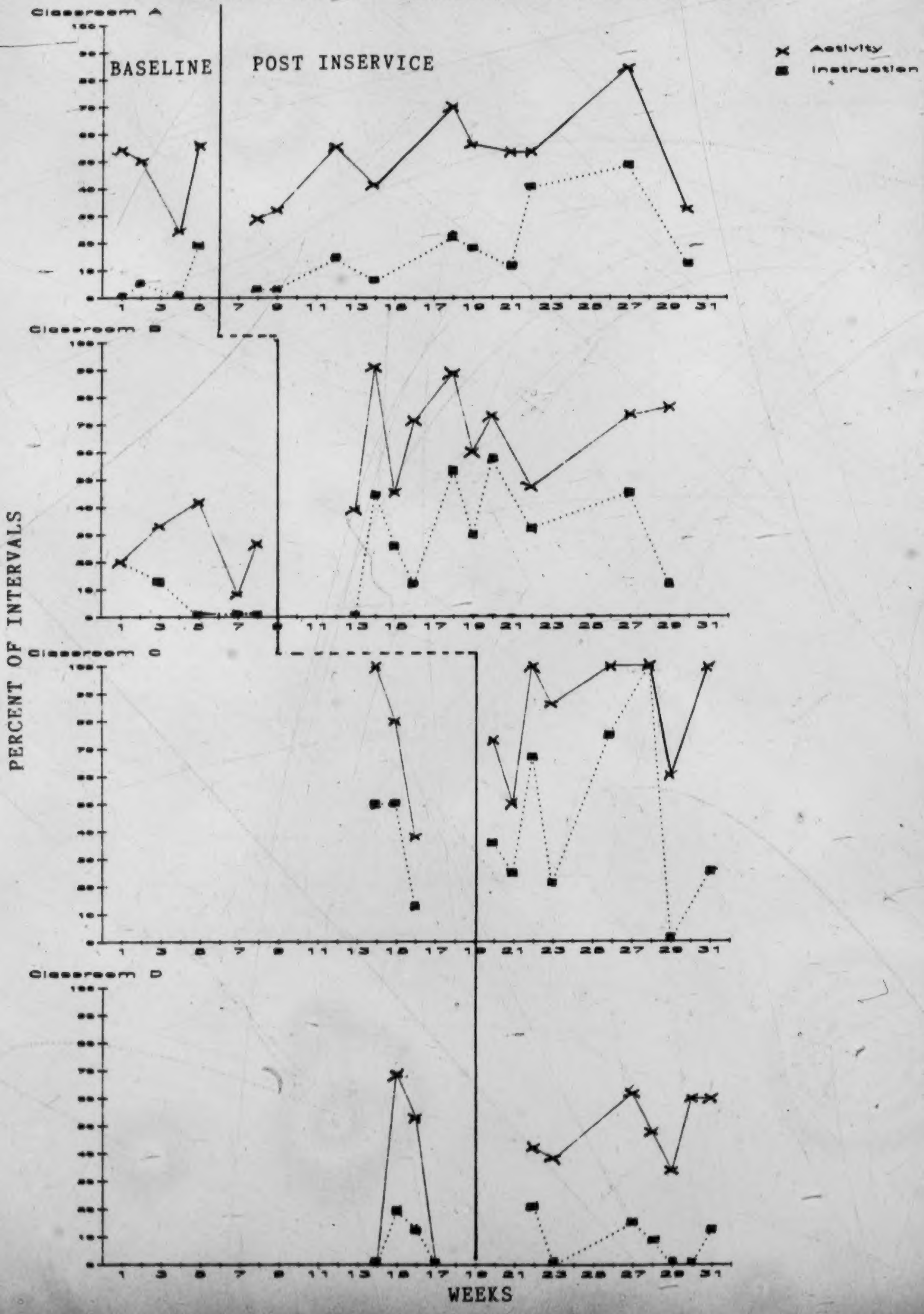
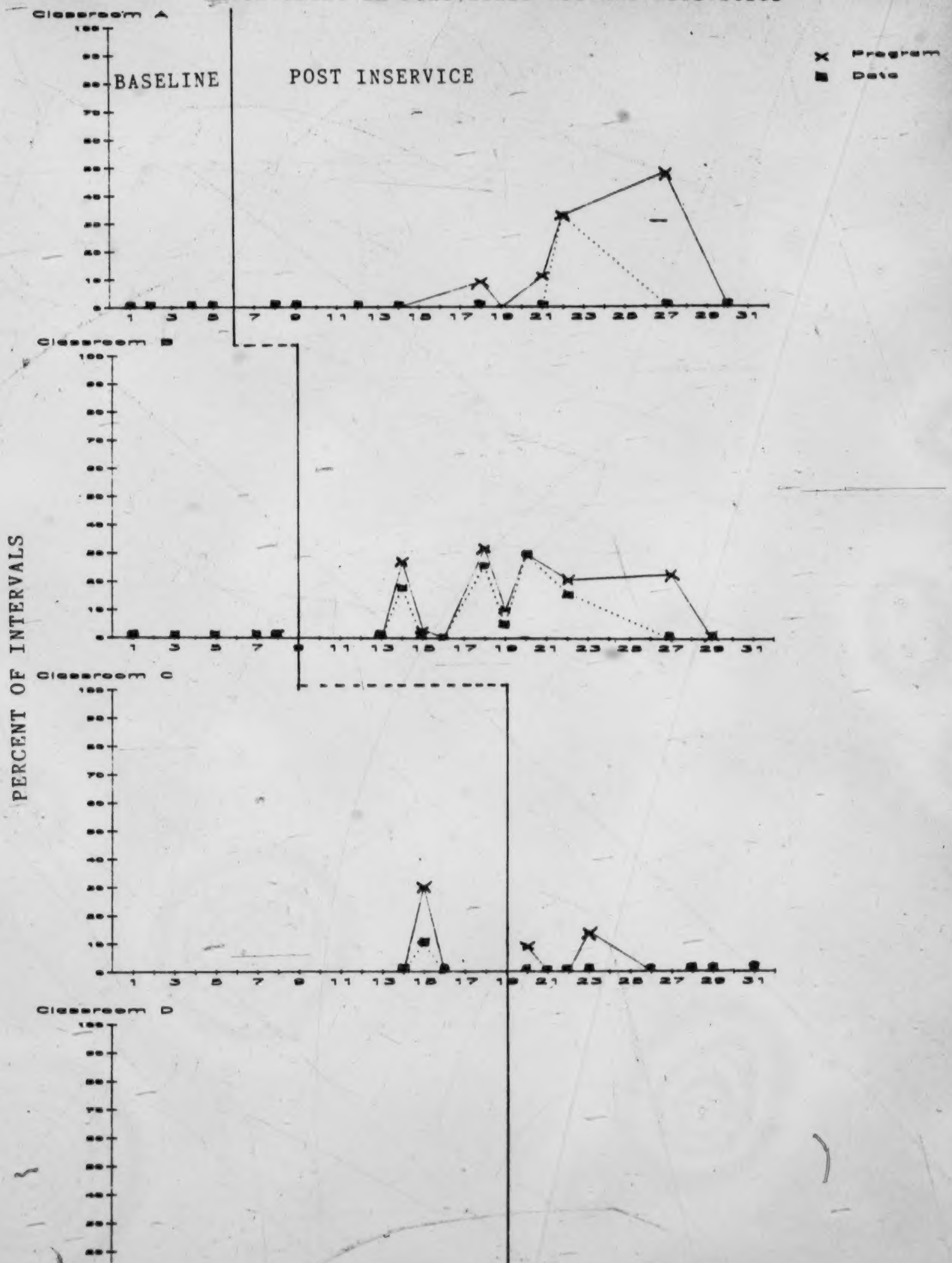


Figure 19
Involvement in Functional Routine Activities



Research Question 10

As a result of training, was there a significant increase during one to one activities in the percent of intervals in which students were involved in functional, age-appropriate activities using functional materials and taught in context

a) at the activity level,

b) involving direct instruction,

c) involving formal instruction based on a written program,

d) in which performance was monitored through data collection?

Figures 20 and 21 examine the changes in the intensity of instruction involving functional tasks in one-to-one situations. The data are characterized by wide variability that resulted from the small number of occasions during which individual instruction occurred throughout the study. Despite this, Figure 20 indicates that in three of the four subjects there was an increase in the mean percentage of student involvement in functional activities containing all three components following training.

In two of the three subjects, while a change of level was evident, there was considerable overlap with baseline data. However, for these subjects, data paths within the treatment phase showed somewhat less variability suggesting that these subjects were beginning to apply these skills more consistently than they had prior to training. Subject A, who showed the most dramatic change in level had a data path with considerable variability suggesting that while she had acquired the ability to select functional activities, implementation was relatively unstable and generally did not show an increasing trend over time.

In Figure 20 a significant increase in direct instruction in functional activities was indicated for Subjects A, B, and C. Despite a clear change in level, the data paths for these subjects showed marked variability. No increasing trend over time was observed.

Data depicted in Figure 21 indicate mixed results in relation to the use of instruction based on written programs. For Subjects A and B, there was a significant increase in the mean overall level of functional instruction based on written programs. Here again, considerable variability was evident. Subject C showed no change over baseline either in level or variability, while the data path of Subject D suggested a gradual decreasing trend.

No significant increases in data collection were observed in any of the subjects. Data Collection remained at a low level for all phases of the study.

Figure 20
Individual Instruction Involving Functional Content

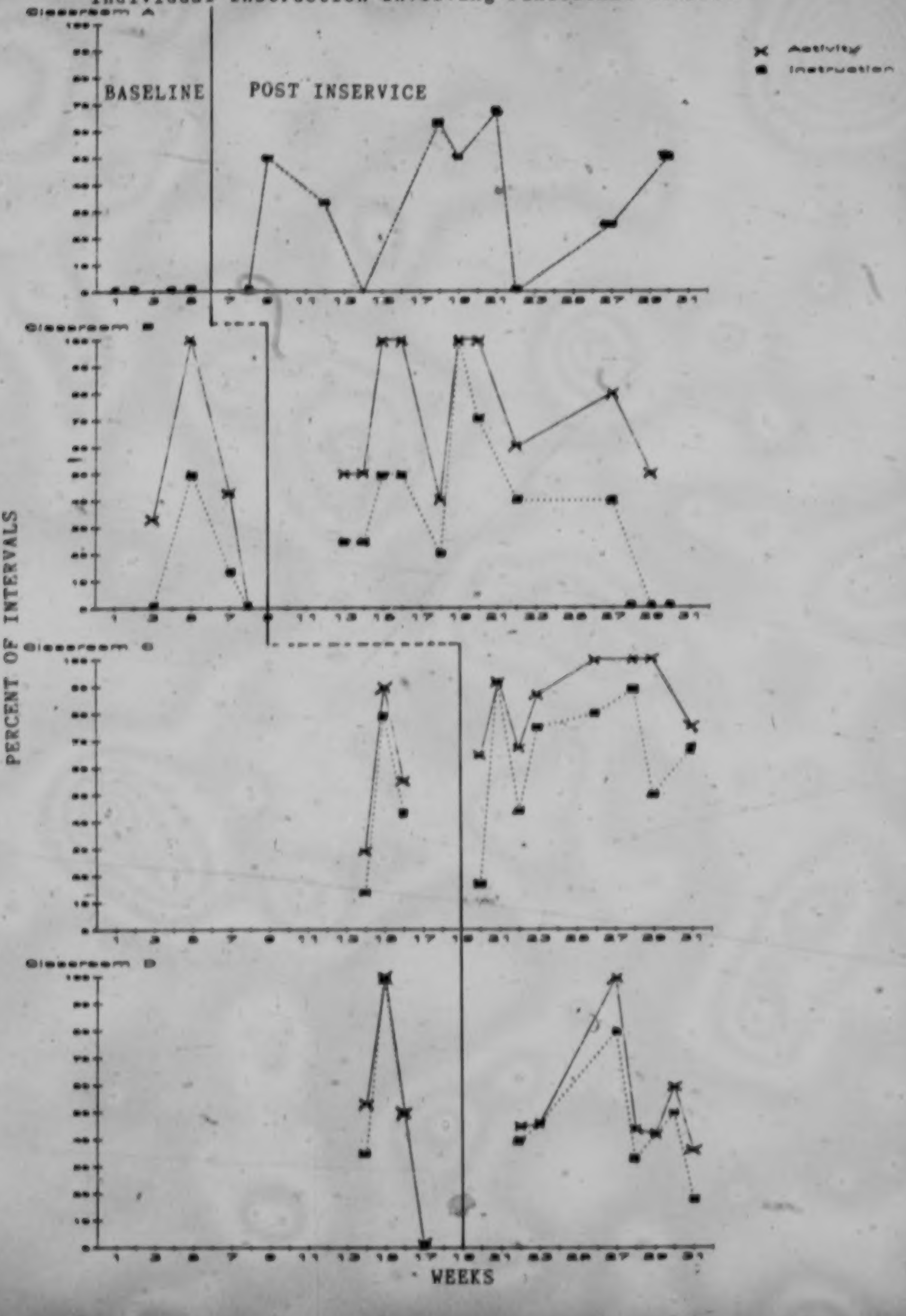
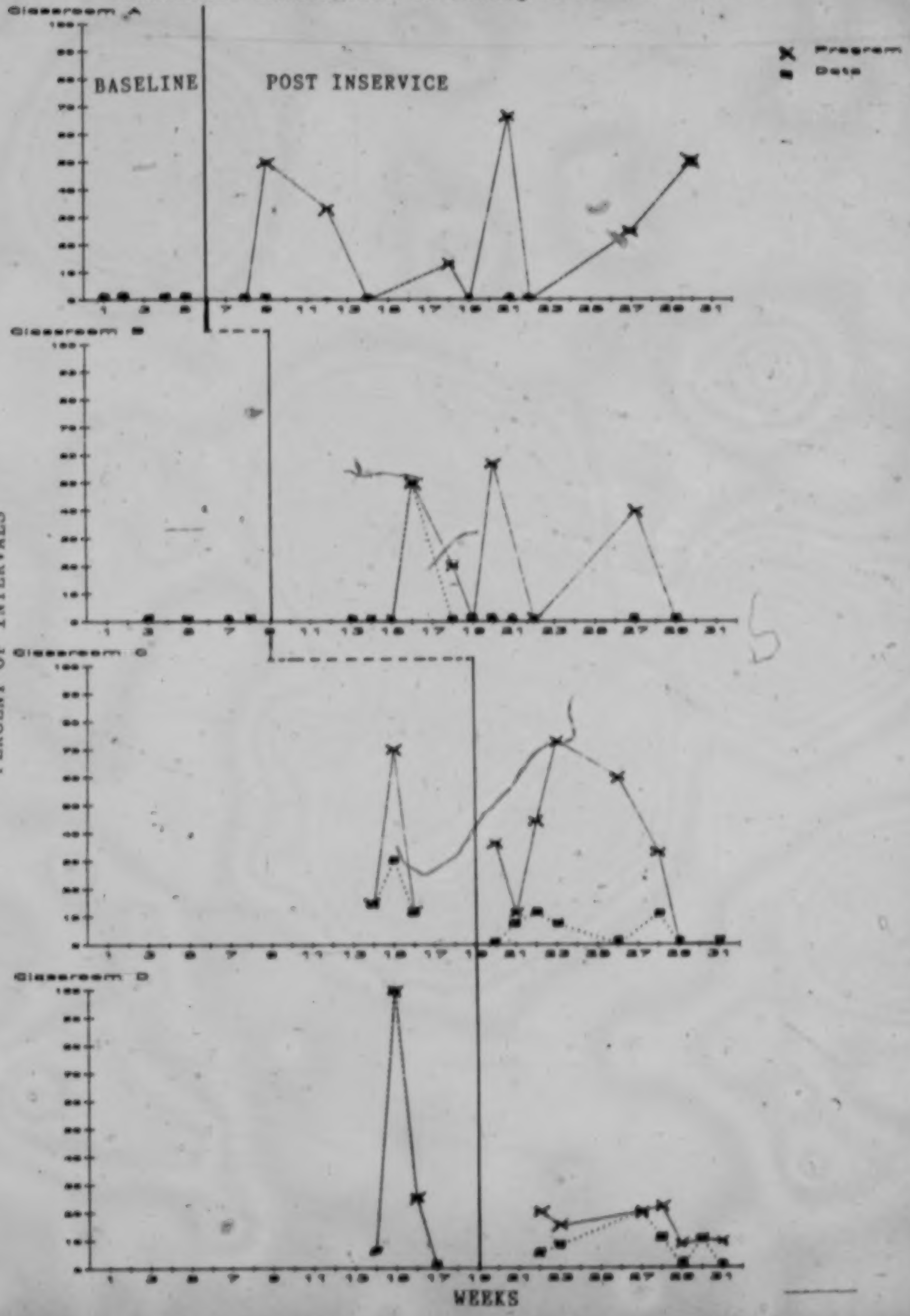


Figure 21
Individual Instruction Involving Functional Content



Research Question 11

As a result of training, was there a significant increase during group activities in the percent of intervals during which students were involved in functional, age-appropriate activities using functional materials and taught in context

a) at the activity level,

b) involving direct instruction,

c) involving formal instruction based on a written program,

d) in which performance was monitored through data collection?

Figure 22 indicates that Subjects A and B showed significant increases in the percent intervals during which students were involved in and received direct instruction in group activities which contained all identified functional components. These subjects also showed an increase in the use formal instruction based on written programs as indicated in Figure 23. No increase was seen in the other subjects.

Figure 23 indicates that only one of the four subjects evidenced any increase in the use of data collection during group activities. It was noted that this increase was sporatic.

Figure 22
Group Instruction Involving Functional Content

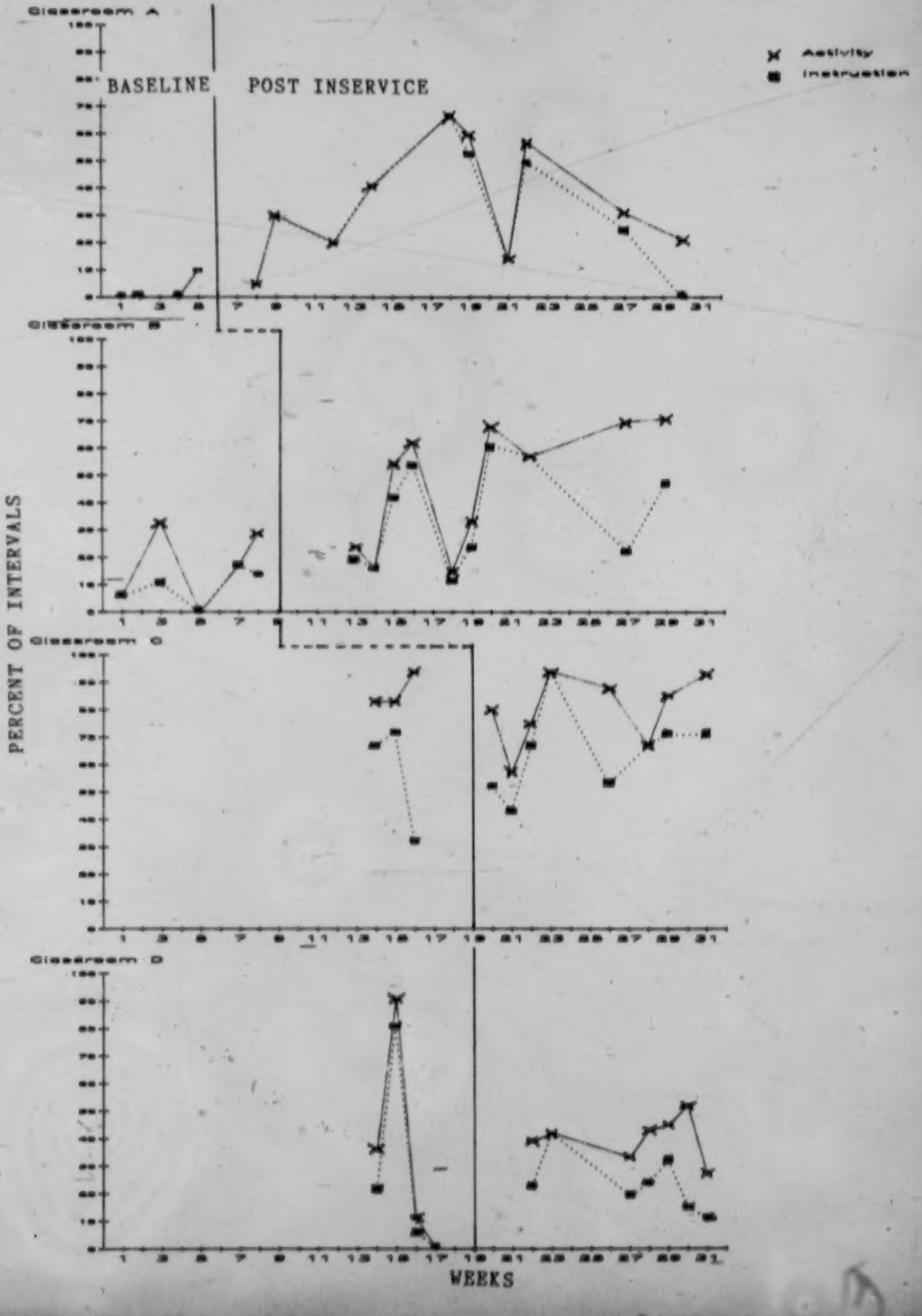
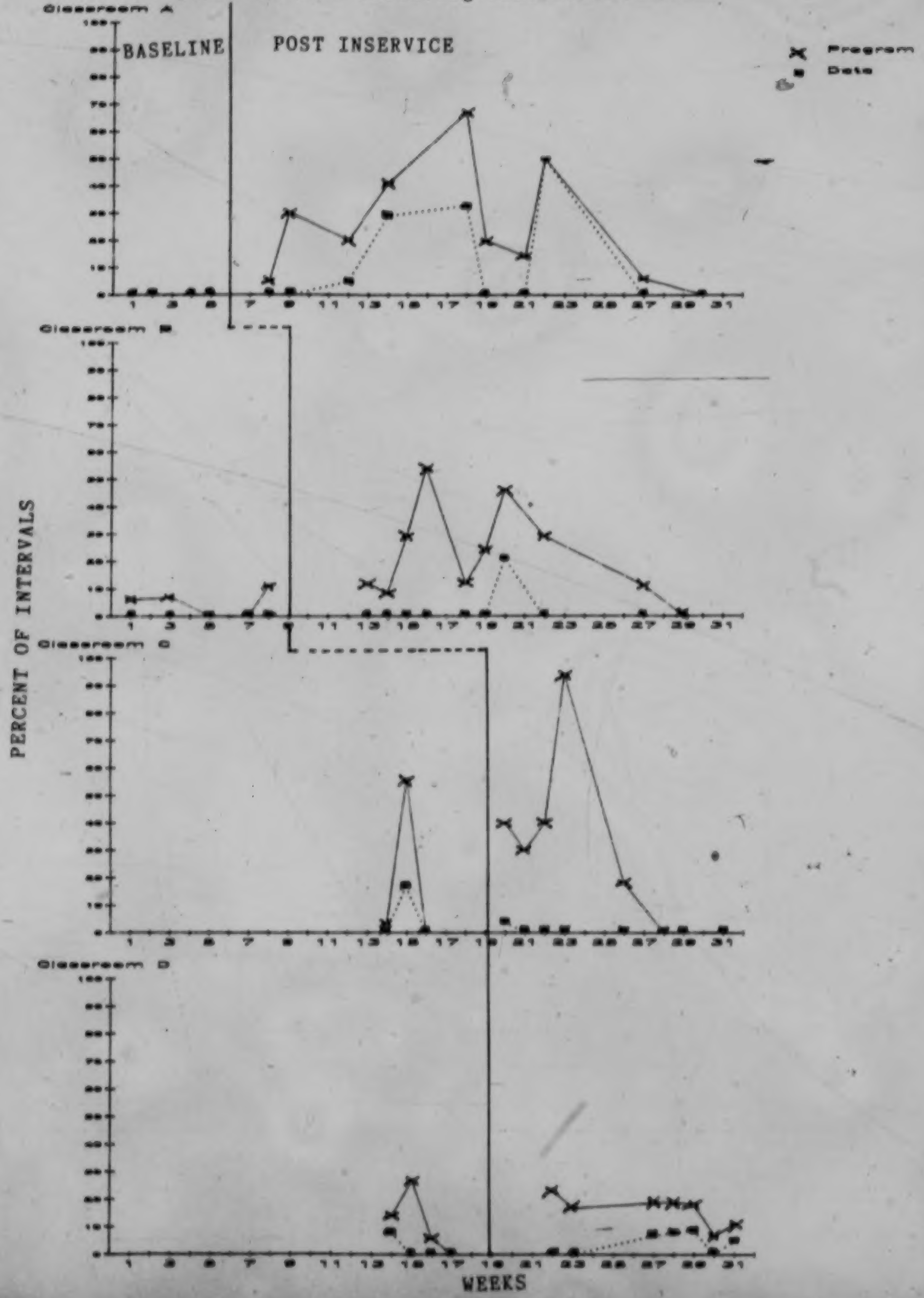


Figure 23
Group Instruction Involving Functional Content



Research Question 12:

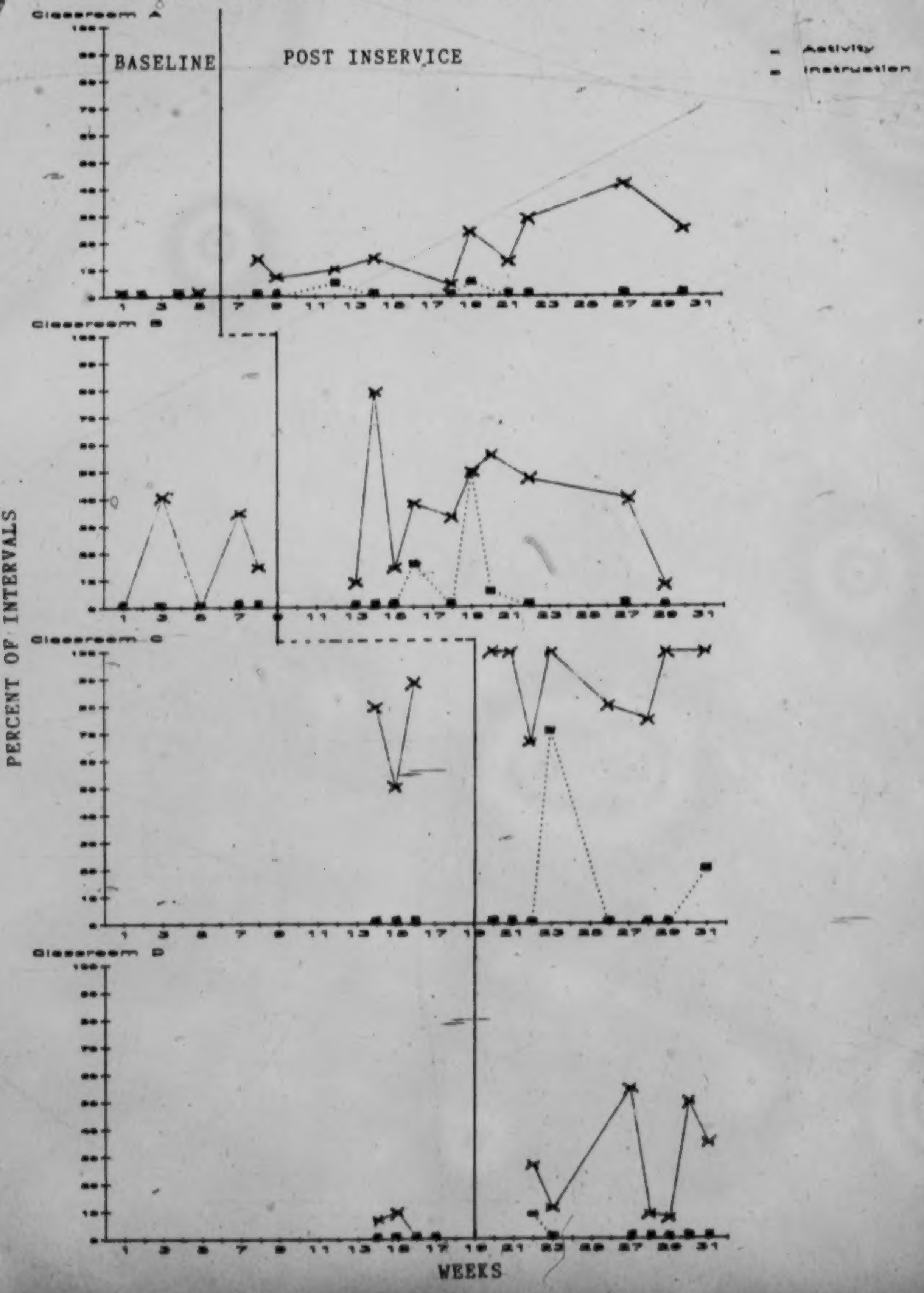
As a result of training, was there a significant increase during freetime activities in the percent of intervals in which students were involved in functional, age-appropriate activities, using functional materials and presented in context

a) at the activity level,

b) involving direct instruction?

Figure 24 shows an increase across all subjects in the percent of involvement during freetime in activities which are functional and meet the other specified criteria. No consistent increase in instruction in these activities was observed. This was not an unexpected finding since freetime is generally characterized by low rates of instruction.

Figure 24
Freetime Activities Involving Functional Content



Research Question 13

As a result of training, was there a significant increase across all activities in the percent of intervals during which students were involved in functional, age-appropriate activities using functional materials and presented in context

a) at the activity level,

b) involving direct instruction,

c) involving formal instruction based on a written program,

d) in which performance was monitored through data collection?

Figures 25 and 26 indicate mixed results across subjects. Subjects A and B evidenced and overall increase across activity catagories in the percent of student involvement and direct instruction in functional activities containing all identified components. These subjects also showed an increase in percent of direct instruction utilizing functional content based on a formal written program. Sporadic increases in the collection of data were also noted for these subjects.

Subjects C and D did not show a significant change in the mean level of functional activity or direct instruction following treatment.

Figure 25
Total Involvement in Functional Activities

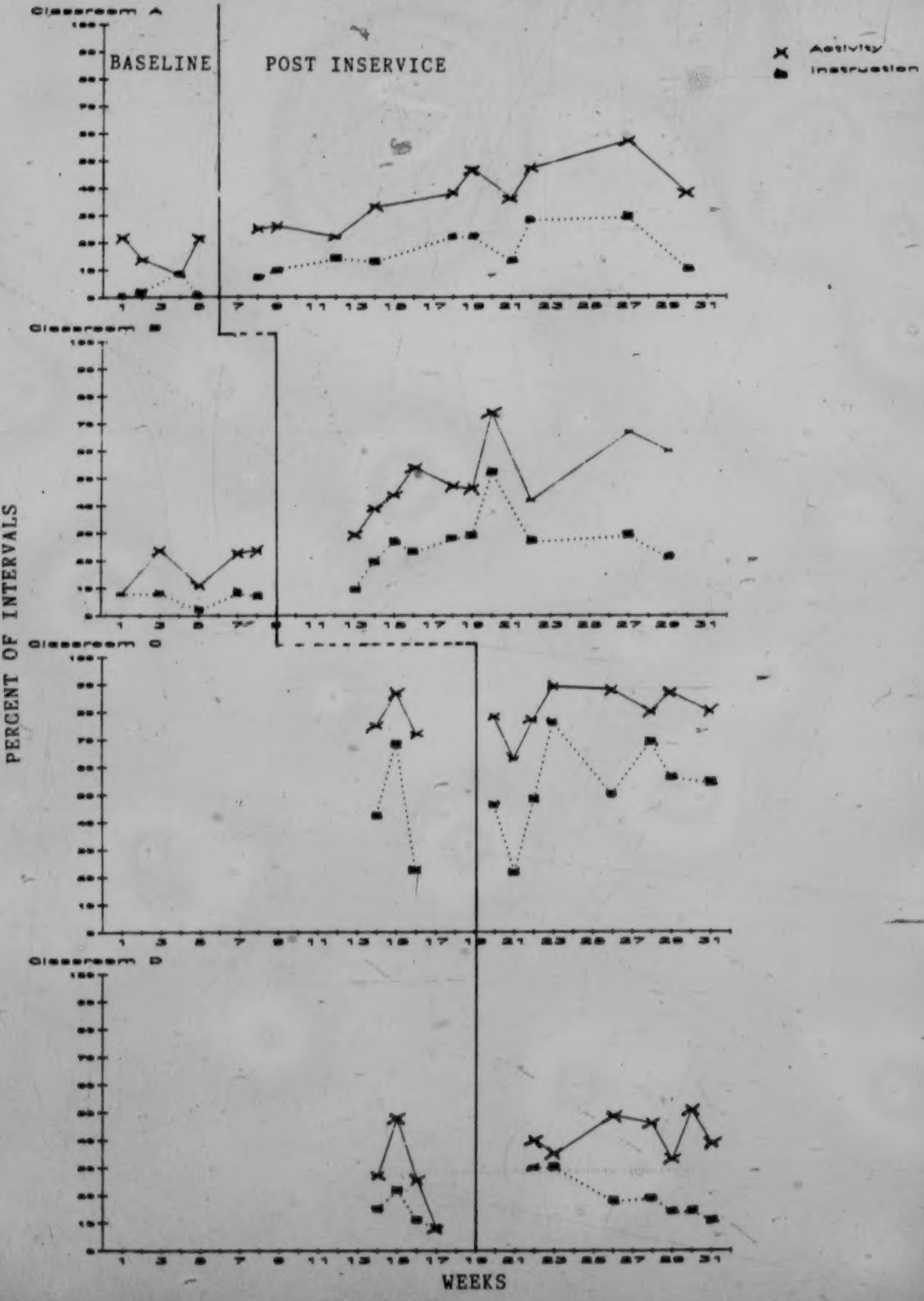
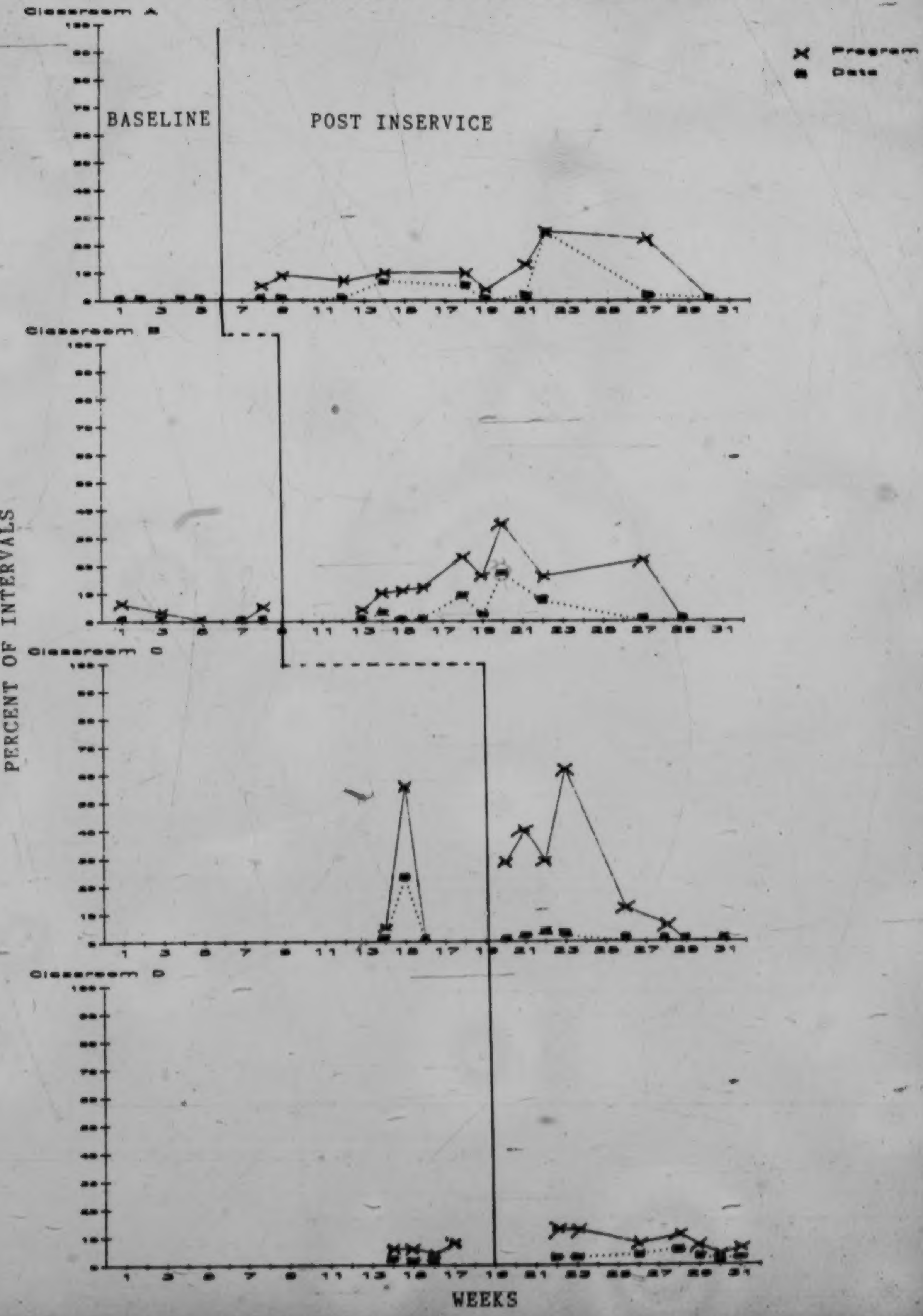


Figure 26
Total Involvement in Functional Activities



Summary Of Results For Questions Nine To Thirteen

The results of depicted in Figures 18 through 26 suggest mixed results in terms of the impact of participation in the inservice on the proportion and instructional intensity of educational programs utilizing functional content containing all critical components. The strongest positive effects were seen at the lowest levels of instructional intensity. An increase of student involvement in functional activities occurred across all types of tasks. Subjects A, B, and C showed an increase in the delivery of direct instruction during individual and routine activities. Only Subjects A and B showed increases in the delivery of direct instruction during group activities. These subjects were also the only ones to show increases in the use of formal written programs to teach functional activities. Changes aggregated across all activities were also only evident for Subjects A and B for all levels of instruction.

Overall Summary of Results

Figures 25 through 28 indicate that the proportion of each instructional day devoted to each of the different classifications of activities remained relatively stable throughout the study.

The results reported for the first series of research questions were aimed to determine changes in instructional intensity regardless of curriculum content. The data summarized in Table 2 suggest that there was also no overall increase in the total amount of student involvement in activities across all four classrooms. An overall increase in the use of data collection to monitor progress was observed in the classes taught by Subjects A and B.

Although the totals did not change, individual subjects did show changes in the amount of student involvement, direct instruction, and the use of written programs for some types of activities. Increases in the amount of direct instruction in routine activities given were observed in Subjects A, B, and C. For Subjects A and B, there was evidence of an increase in the amount of direct instruction based on written programs. A similar pattern was evident during individual activities with Subjects A and B showing an increase in the use of direct instruction based on written programs. No substantial changes in intructional intensity were noted in group or freetime activites.

Table 2 indicates an increase in the percent of student involvement in functional activities for all subjects. Given the previous information the increase suggests a shift in educational content toward more functional activities since the overall amount of instruction did not increase in any of the classrooms. Subjects A and B showed an increase in the percent of functional activities which were appropriate, considering the student's chronological age, and utilized functional materials. Data on the other two parameters, use of functional materials and involvement in the activity in context, suggested that teachers tended to utilize functional materials and to present the activity in context at the level of participation prior to training.

Table 2 suggests that for Subjects A and B the increase in student involvement in functional activities and the amount of direct instruction received in these activities occurred across all activity catagories. Subject C showed an increase in all areas except group instruction situations. Subjects A and B showed an increase across all areas in the use of written programs to teach functional skills. These subjects also showed an overall increase in the use of data collection to monitor student progress.

Taken as a whole the data indicate that there was an increase in the the use of functional activities as the content of instruction across all subjects following participation in the STEP Inservice. The data also indicate that greatest overall change with regard to instructional intensity occurred in Subjects A and B. Chapter seven will provide an indepth discussion of these results.

TABLE 3

Summary of Results

Increase In Instructional Intensity Without Regard to Type of Content

	Routine				Individual				Group				Freetime				Total			
Subject	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Activity	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	Y	N	N	N	N	N
Direct Instruction	Y	Y	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Written Program	Y	Y	N	N	Y	Y	N	N	N	N	N	N					Y	N	N	N
Data Collection	N	Y	N	N	N	N	N	N	Y	N	N	N					Y	Y	N	N

Increases In Instructional Intensity of Functional Content

	Routine				Individual				Group				Freetime				Total			
Subject	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Activity	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	N
Direct Instruction	Y	Y	Y	N	Y	Y	Y	N	Y	Y	N	N	N	N	N	N	Y	Y	N	N
Written Program	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N					Y	Y	N	N
Data Collection	N	N	N	N	N	N	N	N	N	N	N	N					Y	Y	N	N

Y = Yes
N = No

Figure 27
Time Spent in Routine Activities

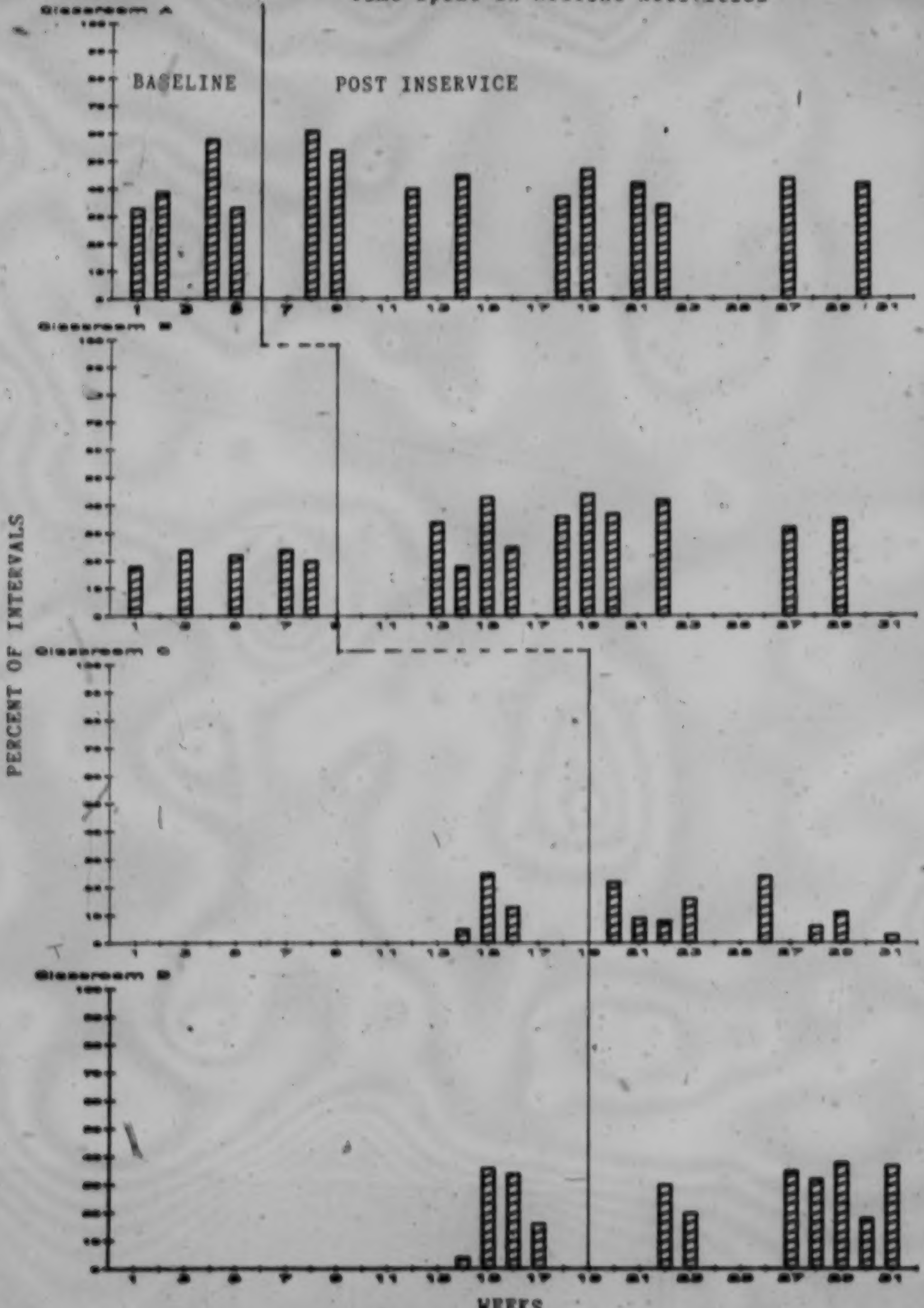


Figure 28
Time Spent in Individual Activities

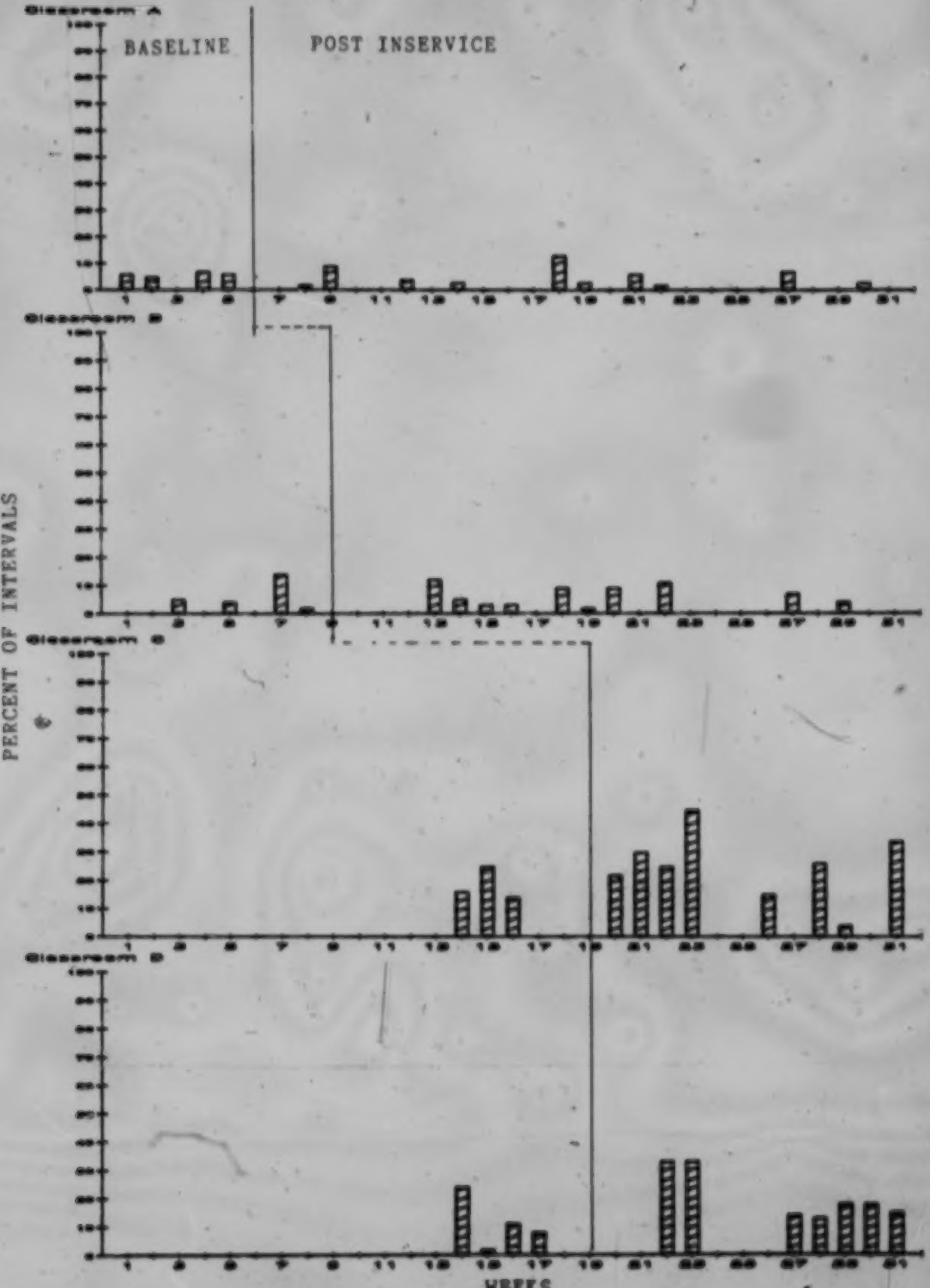


Figure 29
Time Spent in Group Activities

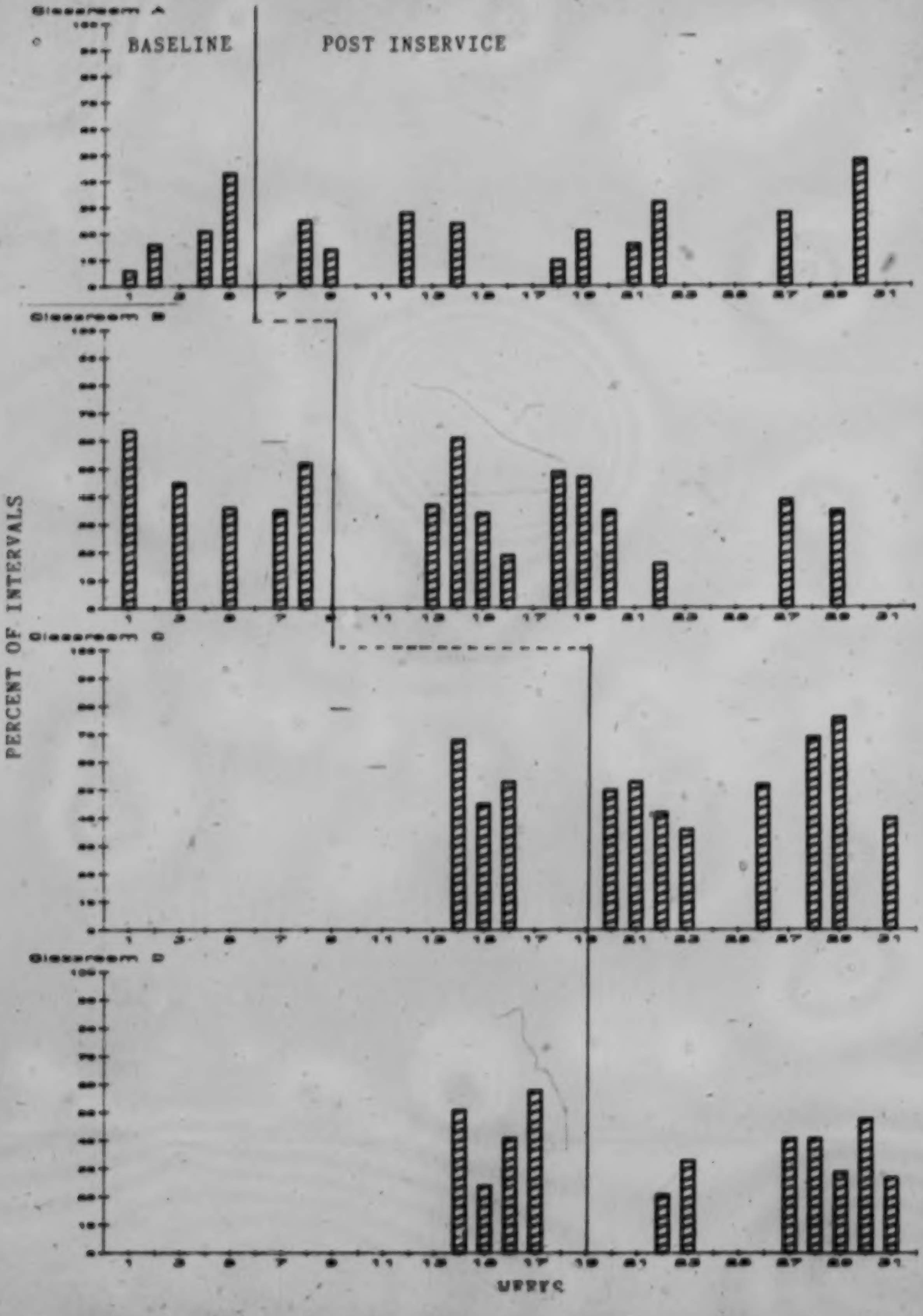
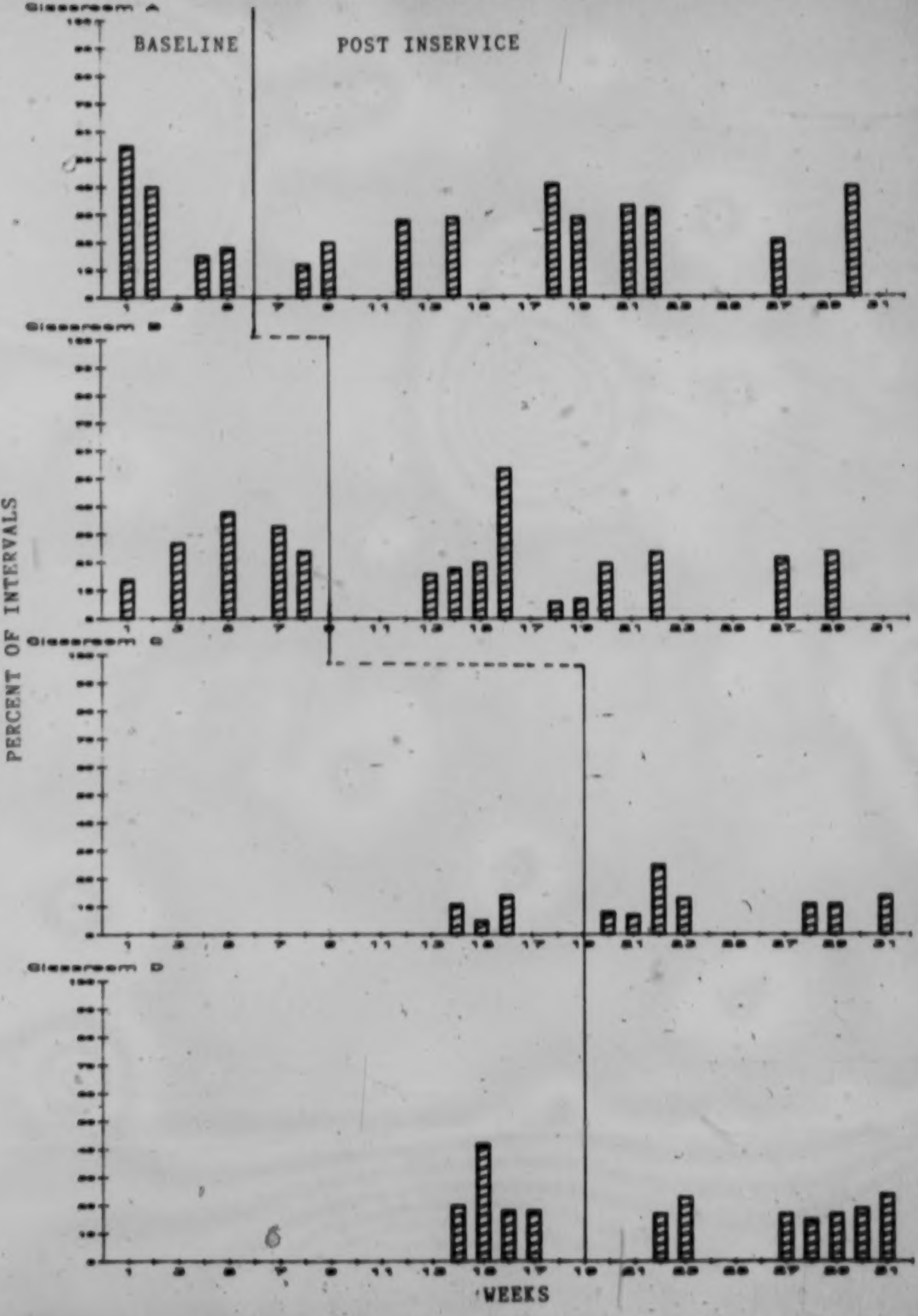


Figure 30
Time Spent in Freetime Activities



Chapter VII

DISCUSSION

The following discussion will attempt to evaluate the specific effects of the STEP inservice program on the variables identified in this investigation. The differential results which occurred across subjects will be closely scrutinized and possible explanations for these effects will be suggested. However, the explanatory hypotheses presented are tentative, as the characteristics of this research design preclude the possibility of making definitive statements concerning the differential results across subjects. That is, given the heterogeneity of the subjects and settings which were present in this study, it is not possible to identify which variable or combination of variables were responsible for the observed differences (Herson & Barlow, 1976). Therefore, this analysis will attempt to identify some of the potentially relevant variables which may have mediated the treatment effects and, as a result, will suggest possible modifications in training procedures to meet the needs of individual teachers and their students.

The research literature has provided some guidelines to interpret the findings of studies utilizing a multiple baseline design. There exists some variance between authors in the number of subjects who must show change in order to establish confidence in the controlling effect of a particular treatment. Wolf and Risley (1971) noted that a set of replications across two subjects while not conclusive can be suggestive of a treatment effect. A generally accepted standard is a set of replications across three to four baselines (Hersen & Barlow, 1977).

One potential problem related to interetation of multiple-baseline designs occurs when the intervention produces inconsistent effects on subjects. Kazdin (1982) suggests that the effects of the intervention may still be quite clear from the two or more subjects who do change following the introduction of the intervention when the proportion of cases showing effects suggests that the subjects who did not change are exceptions. Inconsistent effects do however raise questions concerning the strength and generality of the intervention. The interpretation of the results which follows is based on these guidelines.

Instructional Intensity Across Tasks

The first set of the questions in this study investigated whether or not participation in the S.T.E.P. Inservice resulted in increased rates of student involvement in activities, delivery of direct instruction by staff, use of written programs, and monitoring of student progress through data collection. These questions addressed issues relating to instructional intensity without regard to the appropriateness of the content of instruction.

The data summarized in Chapter Six indicate a slight overall increase in the amount of student involvement in activities following training. These results suggest that as a result of training, teachers were better able organize, select, and present activities so as to enhance student involvement in activities.

Despite the increase in student involvement in activities, there was no overall increase in the amount of direct instruction delivered to students by teaching staff. These findings lend support to the work of Snart and Hillyard (1985) who suggested that student to staff ratio had a critical effect on the amount of instruction delivered to students. Evidence from the literature suggests that constraints such as the student to staff ratio may in fact be very real barriers that cannot easily be overcome or compensated for by a different organizational structure. The finite time limitations may in fact be a major controlling variable in determining the amount of instruction received by each student.

Generally, teachers did not show an increase in the use of written programs following training. All subjects did show an initial tendency to increase the use of written instructional programs but for three of the four subjects this increase was not maintained and an eventual decline to baseline levels was seen. The data suggest that while participation in the inservice initially had a positive effect on the use of formal written programs, the impact was not maintained over time. For three of the subjects, the decline became extremely pronounced toward the end of the study regardless of when they were trained. This fact suggests that some extraneous factor may have been influencing the use of formal programs. While it is beyond the scope of this study to determine the cause of this decline, it is possible that it may be related to the time of year. This effect became most pronounced for three of the subjects in late April and May.

Examination of the data across all levels of instructional intensity suggests that teachers maintain a fairly constant rate of direct instruction throughout the year. This is reflected in a constant level of student involvement in activities. It seems however, as the school year draws to a close, teachers use fewer formal written programs. This reduction may occur because seasonal changes present instructional opportunities which are not available at other times in the year. At this time of year teachers may not feel it is appropriate to develop formal instructional programs to teach these activities due to the short period for implementation because either the student or the teacher may be moving to a different program at the end of the school year.

The results suggest that participation in the training program had mixed effects on the use of data collection techniques by teachers. Subjects A and B showed increases in use of data collection as a method to monitor student progress.

Instructional Intensity During Different Types of Activities

During the study, activities were catagorized into four different types in order to discover if differential effects across subjects were related to the type of activity in which students were involved. The catagories were routine, one-to-one, group, and free-time activities.Some of the findings in terms of instructional intensity within catagories are consistent with the data across all catagories. However, in some cases the results within catagories are different than the overall effect. Comparative analysis of the data across catagories, however, suggests that a relationshiip between the type of activity and the impact of training on instructional intensity. It is noteworthy that there was generally no change across subjects in the proportion of time spent in each type of activity. This suggests that participation does not change the general organization of the classroom. A discussion of the impact of training on the various types of activities follows.

Routine Activities

The data suggest strongly that participation in the STEP Inservice was effective in training teachers to increase the rate at which they and their staff delivered direct instruction during routine activities. Although there was no overall increase in time spent in routine activities, there was an increase for Subjects A, B, and C in the delivery of formal instruction during routine activities which are functional by the definition used in this study. Mc Cormack et al. (1979) found that increasing instruction during custodial tasks was important because it resulted in an overall increase in the amount of instruction delivered to students. The results of this study indicated that the STEP Inservice was effective in training teachers to increase the amount of instruction they provided to students during routine activities. The results also suggested that this increase in instruction could generally be accomplished without increasing the total amount of time students spent in routine tasks.

While the impact on instruction is consistent with the work of McCormack et al (1979) within the context of routine activities, the findings differ with respect to their impact on the total amount of instruction. McCormack et al (1979) found that the increase in instruction during custodial tasks resulted in an increase in the total amount of instruction received by the students. In the present situation, the increase in instruction during routine custodial tasks did not result in an overall increase across activities. The fact that this increase in instruction was not evident when data were calculated across all activities may be related to the number of components which were simultaneously changing. Some changes may have masked the effects of others.

Individual Activities

The most significant changes observed during individual activities occur for subjects A and B. Both these subjects show increases in the mean level of delivery of direct instruction, use of written programs, and data collection. Wide variance is seen in the data related to activities and instruction delivered on a one-to-one basis. These findings reflect the small percentage of time during which students were involved individual activity or instruction across all phases of the study. While the changes observed are suggestive of an effect resulting from participation in the STEP Inservice, they are not conclusive because they occurred in only two of the four subjects. However, the consistent differences related to the impact of training between Subjects A and B and Subjects C and D suggest that other variables such as the timing of training may have affected the impact of the training program. This issue will be addressed in detail later in the discussion.

Group Activities

Examination of the data on the instructional intensity during group programming suggests that the training program impacted differentially across subjects with the greatest changes being seen in subjects A and B. Both of these subjects demonstrated a slight initial increase in the level of direct instruction delivered to students. Initial increases were also seen in Subjects A, B, and C in the use of written programs to present content in a group setting. While the initial impact of training appears to be a positive one, particularly regarding the use of written programs, the decline in the rates of delivery of instruction and use of written programs suggests a concern regarding the long term impact of the training.

Only one of the four subjects evidenced a significant increase in data collection during group activities. Other subjects not only did not show increases but their absolute level of data collection remained extremely low. The results indicated that students spent a fair proportion of their instructional time daily engaged in group activities during which their performance was not being directly monitored through data collection. The importance of data collection as a means of making decisions regarding future programming has previously been identified in the review of the literature (Holvoet et al, 1983). Fredericks et al (1979) also found a positive correlation between the amount of data collection and student progress.

It is possible that the low rates of data collection may be an artifact of the system of observation. Frequently the type of data collected during group activities is probe data. Probe data involves gathering information on samples of behavior. The schedule for collecting these samples is determined by the teacher. It is possible that a teacher might choose to collect data on a particular day other than the one on which the observations occurred and as a result, although data were being collected it would not be observed by the researcher. Similarly, if probe data were only being collected on a small sample of the trials, these might not correspond to the trials during which observations occurred. For these reasons, it is possible that the system of observation used in the study underestimated the collection of data during group instruction.

The importance of data collection and the relatively high percentage of time students spent in group activities makes the issue of developing an efficient means of collecting data within the context of these activities a high priority. Limitations of the present study make it difficult to determine the impact of the STEP Inservice on data collection during group activities. While one subject showed a dramatic increase in the use of data collection, it is possible that this occurred because she chose a schedule that was easily detected given the present observation system. However, since data collection results in a permanent product, future research could examine the prevalence and frequency of data collection by direct observation of student records and programs.

Freetime Activities

No significant changes in either the amount of time spent in freetime activities or student involvement in activities were observed following training. This finding suggests that the increase in student involvement found across the total program primarily occurred in instructional situations such as routine, individual, or group activities.

Freetime is usually considered a necessity due to the limitations in the number of staff able to provide instruction rather than a desired way for students to be spending their time. The fact that the amount of time spent in free time activities remained relatively stable further suggests that participation in the training does not enable teachers to develop an organizational pattern that permits a reduction in the amount of time students spent out of instruction. It is beyond the scope of this study to determine to what extent this was due to a lack of implementation of the organizational pattern suggested and to what extent it is a limit of the organizational model itself.

Summary

The data indicate that participation in the STEP Inservice had little impact on the overall level of instructional intensity across all activities. It also appears that there is a relationship between the type of activity and the impact of training on instructional intensity. Following training teachers delivered more direct instruction during routine activities and some teachers increased the use of written programming during individual activities. These findings suggest that teachers are willing and able to implement some changes.

Hypotheses concerning reasons for the occurrance of changes in some areas and not others are at the present tentative. The lack of impact on student involvement in activities and delivery of direct instruction may be related to physical constraints such as staffing ratio which create real limits the amount of direct instruction delivered and the amount of time spent in different types of activities.

Implementation of written programs and data collection are not impeded by such absolute limitations. Use of written programs in individual activities is similar to the type of programming that has long been recommended for severely handicapped students. This familiarity may have facillitated implementation. The format utilized for group programs and the whole task format generally used during routine activities are more recent developments. As a result they may be less familiar to teachers and therefore more difficult to implement.

While it is beyond the scope of this study to account for the variations in implementation, further investigation of the potential causes suggested here might provide a basis for modifications of the training package the effectiveness of which could then be assessed by future research.

Functional Curricular Content

A second issue under investigation was whether there was a shift toward educational curricular content which was functional, age-appropriate, and taught in a meaningful context using functional materials. The data suggest clearly that participation in the STEP Inservice resulted in an increase in student involvement in functional activities across all classrooms. Data patterns indicate that the information presented on the importance of utilizing age-appropriate activities is not required by all of the subjects. However, where it was required, an increase in the use of age-appropriate content was seen in the subjects's classroom following training. The data also suggest that at the lowest level of instructional intensity, involvement in the activity, functional materials were used prior to attending the inservice. Similarly at a low level of instructional intensity, the data suggest that teachers involved students in functional activities within a meaningful context prior to training.

One might be tempted to infer from the high pretraining levels shown related to the use of functional materials that training in this area was not necessary for the majority of the teachers who took part in the inservice. However, teachers may be ready for more sophisticated criteria for functional materials such as those suggested by Horner et al (1983). Teachers might benefit from specific training in how to sample the range of materials in order to enchance generalization.

Similarly the high pretraining levels shown in relationship to teaching in a meaningful context at the activity level do not necessarily indicate that teachers have mastered the skills required to present functional activities meaningfully at more intensive instructional levels of instruction.

The data suggest that participation in the training had a mixed impact on student involvement on activities which contained all the functional components, that is they are functional, age-appropriate, use functional materials and occur within a meaningful context. The increases found in Subjects A and B reflected the increase previously noted in the selection of age-appropriate activities by these teachers.

Location of Instruction

The study investigated whether there was more instruction occurring in natural locations following participation in the inservice training program. The data indicate that there was no change in the location where functional skills were taught following participation in the STEP Inservice. Generally across all subjects skills tended to be taught in natural locations within the segregated areas of the school. The results suggest the difficulty of organizing instruction within integrated environments.

While the teacher has great control over the activities occurring in the classroom environment, providing instruction in integrated settings requires the co-operation and support both financially and in principle of persons such as other teachers, administrators and community members who have more limited exposure to and knowledge of the needs of the severely handicapped. One possible reason for the lack of movement toward more instruction occurring in integrated settings within the school and the community was related to this factor. There appears to be a need for administrative understanding and support of teacher initiative to provide instruction in natural settings outside of the segregated areas of the school since most skills which are critical educational content occur primarily in locations other than the special education classrroom. While the present inservice package suggests the use of community based instruction, it does not provide teachers with a strategy for accomplishing this complicated result. The findings of this study suggest strongly that teachers require more support in order to be able to implement this recommendation.

The uniqueness of each particular school situation relative to such issues as the personnel involved, school organization, and financial constraints suggests that it would be difficult to develop a training package for teachers. Perhaps this function could best be accomplished by joint planning between the teacher, school staff and consultants who could serve as advisors to the school. Consultants could act as facilitators of change by inservicing school staff, developing an mplementation plan and making schools aware of other schools where the logistical barriers were successfully overcome.

Instructional Intensity of Functional Educational Content

The final set of objectives in this study attempted to indentify the instructional intensity of activities which were functional, age-appropriate and which were taught in a meaningful context using functional materials. The mixed results across subjects are suggestive of a treatment effect for two of the four subjects. The results also indicate a significant increase for two of the four subjects (A and B) in the percent of time students were involved in functional age-appropriate activities which were taught in context using functional materials. Increases were also seen in the use of direct instruction and formal written programs utilizing functional activities. No change was noted in the other two subjects in the use of functional tasks across all types of activities.

The pattern of the data at all three levels of instructional intensity for Subjects A and B suggests a continuity from baseline scores. However unlike baseline measures, an increasing trend is found in the post-treatment phase. This suggests a gradual change in the direction of an increasing use of functional educational content following participation in the inservice. The gradual pace of implementation of functional content is consistent with the expectations of the researcher due to the extent of the organizational changes required to significantly increase the quantity of functional programming. Teachers require time to select appropriate functional activites for their students, purchase the necessary instructional materials, and develop new schedules to maximize instruction during routine tasks.

The data indicate that in general the shift to use of functional content occurred more quickly at lower levels of instructional intensity. The development of formal written programs particularly those specifically designed to meet the instructional needs of individual students is a time consuming activity for teachers and this was reflected in the gradual implementation curve. This trend continues to the highest level of instructional intensity, involving data collection. Although there is some evidence of an increase in these subjects the change is small and sporatic.

Generally the changes that were observed within the catagories of routine, individual, group, and freetime activities were consistent with those observed when data were calculated across all tasks. However, some differences were observed within specific types of activities. These will be discussed in the following section.

Instructional Intensity of Functional Content During Different Types of Activities

Routine Activities

By definition, activities catagorized as routine are also functional. Therefore, there are few differences between the data reviewed here and those discussed in the earlier section reviewing the impact of training on routine activities. The significance of the increase seen in this area both in student involvement in activities and in the delivery of direct instruction for three of the four subjects rests in the fact that these activities are an essential part of the school day. Since students must spend time on these activities, any increase in instructional intensity is likely to increase the probability that the students will gain proficiency in at least some aspects of the skill.

Individual Activities

The data suggest that the impact of training on increases in student involvement in functional activities was mixed with two of the subjects showing an increase. The greatest relative change is evident in Subject A who had the lowest baseline level. The impact of training on teachers with higher baseline performance levels is less. This pattern of effect was also found for the use of formal written programming. The data suggest that the training package was effective in introducing teachers to new concepts but may have less impact on teachers who already evidence some skill during baseline.

Group Activities

Although there was no increase the level of instructional intensity, the data indicate that a substantial increase occurred in student involvement, delivery of direct instruction, and use of formal written programs related to functional content for two of the four subjects. This combination of data suggests that although the absolute amount of instruction at each level remains relatively constant, a shift to more functional content occurred for these subjects.

Freetime Activities

A clear shift toward more use of functional content during freetime was demonstrated across all four subjects suggesting again the positive impact of the inservice on the teachers' abilities to select instructional content which was functional.

Summary

The clear shift toward more student involvement in functional activities was definitely a positive outcome of the training. It suggests strongly the potential of STEP Inservice in enabling teachers to provide their students with meaningful learning experiences. However, it should be noted that the nature of this study made it necessary to utilize an accepted, yet very broad, definition of functional content.

The slow rate at which severely handicapped students acquire new skills has been noted in the literature review. While involving students in functional activities is a necessary step in the development of a quality program, it is not sufficient to ensure the highest callibre of programming content. Because severely handicapped students cannot learn all functional activities which might be of some utility to them in the future, teachers must select and priorize functional activities based on the specific needs of individual students and their environments. The vehicle for selecting these activities is the students IEP. In order to truly measure the quality of the student's educational program it is suggested that future research investigate the functional nature of the student's IEP and also the amount of time students are involved in activities that have been judged to have specific functional relevance to them.

The data suggest that some teachers were willing and able to introduce changes in their classrooms following training such as the increased use of task analysed written programs and monitoring progress through data collection. These factors have been found to be directly related to student learning (Fredericks et al., 1979). Thus, in regard to these variables, the training can be said to have resulted in an overall improved quality of programming for students in two of the four classrooms observed.

Differential Treatment Effects Across Subjects

Generally, changes following treatment are seen in the first two subjects who participated in the inservice. In contrast, for most variables, little change was seen in the other two subjects. Several factors may have accounted for the lack of change noted in Subjects C and D. Subject C evidenced very high percentages of functional activities during baseline. These scores can likely be attributed to the characteristics of the students in her program. Subject C taught in a preschool program. Generally, the difficulty of determining functional and age-appropriate activities for students increases as the student gets older. In the present instance, baseline rates were so high for Subject C that a ceiling effect is indicated.

Subject D began to teach in her classroom several weeks prior to the commencement of baseline observations in her room. She entered an already established program to replace a teacher who was on leave. Given this situation, it is likely that, to some extent, the program observed during the baseline period reflected the instructional strategies implemented by the previous teacher. This situation was not known to the present experimenter and is a seriously confounding factor in interpreting the effect of the inservice program. In the present instance, the data suggest that no change in the level of student involvement occurred following training. However, it is not possible to determine the impact of the training on these results due to the aforementioned staff change.

Potential Impact of the Timing of Training

It is possible that the timing of the training may have had some effect on the degree to which teachers implemented various recommended components. The data suggest an overall decline in the intensity of instruction across all subjects during the last three weeks of the study. While the level of student involvement in activities remained relatively stable, the use of direct instruction, written programs and data collection fell off in some cases dramatically toward the end of the study which occurred in mid May.

To some extent the difference in the degree of implementation between subjects may also have been affected by the timing of the training. Generally the greatest changes following training occurred in Subjects A and B who were trained in late November and early December. Schools have a distinct cycle which effects teacher needs and priorities during the course of the school year. Start-up in September involves activities such as assessment and IEP development. For example, schools within the Edmonton Public School District are required to submit IEP's for special needs students by the end of September. This phase is followed by program development and implementation. By May, teachers are frequently shifting to less structured activities to take advantage of mild weather. In many cases, as well they are preparing to transfer their student to a new classroom, program, or teacher.

It is likely that the variables addressed in this study are particularly sensitive to the timing of training. The process of implementing a truly functional curriculum requires an in depth ecological assessment, followed by a priorization and selection of appropriate instructional goals to be the basis of the student's IEP. The educational activities are then developed to reflect these priorities. All of the training sessions occurred after the initial process of program development should have been completed. This is particularly true for the last training session which occurred in late February.

A comparison between the degree of implementation for Subjects A and B and Subjects C and D suggests that presenting this particular training package six months into the school year may not result in optimal implementation within that same school year. It is possible that Subjects C and D would increase the extent to which they implemented the recommendations of the training program in the upcoming school year. However, it is likely that the delay between training and the opportunity for complete implementation would reduce the effect of the inservice.

Further evidence that the present scheduling of inservice training was less than optimal resulted from incidental observations in the classroom. Only Subject B revised her student's IEPs following training. Thus, while it was possible to identify programs which met general functional criteria, they were not necessarily activities which had been identified as critical to the student's ability to function more effectively in multiple natural environments.

The training model described is intended to provide a complete system of classroom instruction for severely handicapped students. It presents, within the weeklong inservice, the various components which a teacher is to implement over the course of the school year. The training program also provides teachers with a recommended sequence for implementation of the components. The results of the present study suggest the importance of timeliness in determining the extent to which teachers implement the recommendations of specific instructional models. Further research in this area is necessary to determine the extent to which timing affects subsequent implementation. This investigation should address all objectives taught in the training program to determine how their implementation is affected by the timing of the inservice.

The weeklong training model was adapted from the Teaching Research Program and arose as a means of servicing persons from all areas of North America who desired the training. The S.T.E.P. Inservice was also organized to enble it to be used to train both teachers who resided anywhere in Nothern Alberta although to this date it has only been used to train local teachers. Given the constraints of the present system of training, that is, that only about four teachers can be trained in a session, it would appear that some alteration in the present system of training may be necessary in order to increase the timeliness, the immediate utility, and subsequently the implementation of the information presented to teachers.

In the present situation where most of the participants live within the city or locally surrounding areas, a series of shorter inservices would be feasible. It is suggested also that the utility and impact of the training program might be enhanced if training was spread over the course of the school year. Rather than a few persons receiving the total training package early in the year, all teachers who are to be trained in a particular school year should be identified at the beginning of the school year. The content of the training program would be sequenced so as to meet the needs of the teachers at various points in the year.

The approach of presenting a series of inservices with follow up on the objectives presented in each session was used successfully by Grigg (1983). A similar approach is presently utilized by Edmonton Public Schools for the Effective Teaching Program. In this model, following each session, the trainer observes each teacher in his or her own classroom to provide support, assistance, and feedback in an effort to maximize implementation of recommended concepts. This sequential training approach might be more successful because the process of implementation would be less complicated.

This model would also have the advantage of having a more intensive formal system of follow-up and support. While the present system can provide this level of support on teacher request, some teachers may be reluctant to request support in addition to what is specified because they may feel that such a request might be seen as an indication of a weakness in their own ability to implement the program.

Need for Pretraining Classroom Observations

The evidence of high baseline scores in some areas suggests that it may be beneficial for those preparing the training program to do initial visits to classrooms prior to training. This inservice was designed to provide teachers with a comprehensive and cohesive system which would address all aspects of instruction and organization. It is apparent that while some teachers already possess some of the skills and abilities addressed through the training program, there is a need to address to a certain extent all the components in order to demonstrate how they go together. Despite the need to cover all components of the inservice package in order to present a coherent model, pretraining observations would porvide the trainers with information which would enable them to adjust their emphasis on the various training components as required.

Conclusion

The initial data from this study suggest that there is a need to provide teachers with skills which will allow them to maximize the amount, intensity, and relevance of instruction which students with severe disabilities receive.

The results of the present study suggest that participation in the STEP Inservice has some positive impact on these dimensions of instruction. The differential results across subjects, types of activities, and levels of instruction indicate the need for further research in order to determine methods to enchance the effectiveness of this training program. This discussion has already suggested some directions for change. Evaluation of the appropriateness of these alterations could be determined through future research.

In addition, the present model, which utilizes staff who have the potential of ongoing contact with teachers following the training, is ideal in terms developing a system to offer maximum assistance to teachers as they try to implement the objectives of the training. As well as being beneficial to the teacher, this feature places the trainers in a situation where they have access to varied and detailed information which can form the basis for potential improvements in the content and delivery of this training package.

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APPENDIX A

Objectives of Inservice Package

Objectives	Activity/Evaluation
Assessment/Curriculum	
1) There will be an increase in the proportion of functionally written programs.	1a) During training the trainee will write a functional skill sequence with 90% accuracy. 1b) During the followup assessment visit, at least 70% of the written programs for each student will be functional.
2) The percentage of time which the students engage in functional activities will increase.	2) During the followup assessment visit, at least 80% of the time students will be engaging in functional age-appropriate activities using functional

	materials.
3) The trainee will demonstrate the ability to task-analyze programs.	3) During the followup assessment visit, at least 80% of programs have been task analyzed by the trainee for a particular student.
4) As a result of training the trainee will demonstrate the ability to use ecological assessement and standardized assessment instruments to effectively develop the students IEP's.	4a) During training the trainee will demonstrate the ability to administer part of a standardized assessment instrument to a peer, using correct cues, consequences and reinforcement procedures. 4b) During the followup assessment visit all of the students sampled (1/4) of the classroom population will have been assessed in at least two areas/domains. 4c) During the followup assessment visit all of the students sampled

	(25%) of the classroom population will have at least 80% of their programming based on initial assessment information.
5) As a result of training, the percentage of programs occurring in context will increase.	5) During the followup assessment visit, at least 3 programs for each student sampled (25% of the class- room population) will occur in the natural context and at appropriately occurring times.
6) As a result of training, the trainee will be able to priorize goals and objectives for students.	6) During training, the trainee will receive 100% on the assessment study question.

Instructional Design

7) As a result of training, the trainee will demonstrate correct delivery of cues and	7) During training and the followup assessment visit, the trainee will score 90%

consequences in 1:1 teaching situations.	appropriate delivery of cues, consequences, and accuracy in recording data on the Individual Observation form.
8) As a result of training, the trainee will demonstrate correct delivery of cues and consequences in group teaching situations.	8) During training and the followup assessment visit, the trainee will score 90% on the appropriate delivery of cues and consequences on the Group Observation form.
9) As a result of training, the trainee will demonstrate the ability to train the classroom staff in the use of appropriate cues and consequences in 1:1 teaching situations.	9) During the followup assessment visit, the classroom staff will score 90% on the Individual observation form in the areas of cue and consequence delivery and data collection.
10) As a result of training, the trainee will demonstrate the ability to train the	10) During the followup assessment visit, the classroom staff will

classroom staff in the use of appropriate cues and consequences in group teaching situations.	score 90% on the Group Observation form in the areas of cue and consequence delivery.

APPENDIX B

Inservice Training Package

Presentation of Content

CONTENT	METHOD OF PRESENTATION
1) Assessment/Curriculum	Lecture/Visual Aids Role Play/Corrective Feed-back Homework Assignment
2) Instructional Design -classroom roles	Lecture/Visual Aids Demonstration Role Play/Corrective Feed-back Hands on Practice/Corrective feedback Study Questions
3) 1:1 Instruction (Written Program - clipboard)	Lecture/Visual Aids Small Group Discussion Hands on Practice/Corrective feedback Homework Assignment

4) Supervising Classroom Staff	Lecture/Visual Aids Demonstration Hands on Practice/ Corrective feedback Role Play
5) Data Analysis	Lecture/Visual Aids Demonstration Self-correcting exercise Hands on Practice/ Corrective feedback Homework Assignment
6) Group Programming	Lecture/Visual Aids Demonstration Hands on Practice/ Corrective feedback Homework Assignment
7) Working with Parents and classroom staff	Lecture/Visual Aids Small group discussion Study question
8) Behavior Management	Lecture/Visual Aids Small group discussion Study question
9) Functional Programming	Lecture/Visual Aids

Small group discussion

Study question

APPENDIX C

Student Characteristics

Program No.	Child No.	C.A.	Sex	Handicap/ Ambulation
A	01	8-01	F	developmental delay walker
A	02	7-11	M	developmental delay cerebral palsy visual impairment wheelchair
A	03	16-05	M	developmental delay canes
A	04	18-02	M	developmental delay wheelchair
A	05	15-02	F	developmental delay physically handicapped visual impairment wheelchair
A	06	14-08	M	developmental delay cerebral palsy wheelchair
A	07	6-11	F	developmental delay cerebral palsy convulsive disorder wheelchair
A	08	10-07	M	developmental delay cerebral palsy wheelchair
A	09	15-03	M	developmental delay convulsive disorder walker

Program No.	Child No.	C.A.	Sex	Handicap/ Ambulation
B	10	10-04	M	developmental delay convulsive disorder microcephaly walks
B	11	11-11	M	developmental delay spastic quadriparetic cerebral palsy wheelchair
B	12	13-11	M	developmental delay cerebral palsy wheelchair
B	13	9-08	F	developmental delay autism walks
B	14	12-04	M	developmental delay walks
B	15	10-05	F	developmental delay cortical atrophy mild hearing loss convulsive disorder wheelchair
B	16	12-11	M	developmental delay convulsive disorder walks hesitantly
B	17	13-08	F	developmental delay cerebral palsy wheelchair
B	18	11-07	F	developmental delay hypotonic leg braces microcephaly crawls, wheelchair

Program No.	Child No.	C.A.	Sex	Handicap/ Ambulation
C	19	5-09	F	developmental delay visually impaired behavior disorder walks hesitantly
C	20	6-01	F	developmental delay autism walks
C	21	6-01	M	developmental delay autism walks
C	22	5-02	M	developmental delay autism walks
C	23	4-07	M	developmental delay walks
D	24	17-11	F	developmental delay spastic quadriplegia wheelchair
D	25	16-00	M	developmental delay walks
D	26	15-06	M	developmental delay cerebral palsy convulsive disorder wheelchair
D	27	16-02	F	developmental delay convulsive disorder microcephaly wheelchair
D	28	18-07	F	developmental delay visual impairment spastic quadriparesis wheelchair

Program No.	Child No.	C.A.	Sex	Handicap/ Ambulation
D	29	14-09	F	developmental delay autism walks
D	30	15-10	F	developmental delay spastic diplegia convulsive disorder wheelchair
D	31	17-06	M	developmental delay athetoid spastic quadriplegia wheelchair
D	32	13-08	M	developmental delay walks

APPENDIX D
Staff Characteristics

Program Pos.	Staff Training	Professional Experience	Prev. worked	Yrs.	No.
A	Teacher	B.Ed.	TMH Dependent Handicapped	6 1/2 yrs	
A	Aide	-	TMH Dependent Handicapped	11 years	
A	Aide	Rehab. Practitioner	TMH Dependent Handicapped	3 years	
A	Aide	-	Dependent Handicapped	3 years	
B	Teacher	B.Ed. Special Education	Dependent Handicapped TMH	7 years	
B	Aide	Grade 12	Dependent Handicapped	9 months	
B	Aide	-	Dependent Handicapped	5 years	
B	Aide	-	Dependent Handicapped	4 years	
C	Teacher	B.Ed. Special Ed. Early Ed.	Dependent Handicapped Autistic Mentally Handicapped	4 years	
C	Aide	Teaching Certificate	Dependent Handicapped	8 years	
C	Aide	1 year Special Ed. University	Dependent Handicapped Autistic	6 years	

Staff Characteristics

Program Pos.	Staff Training	Professional Experience	Prev. worked	Yrs.	No.
D	Teacher	B.A, B.Ed. M.Ed. Special Education	Worked with Dependent Handicapped students in group home	4 years	
			Taught D.H. students	6 years	
D	Aide	Grade 12	Volunteer working with the handicapped	2 years	
D	Aide	Grade 12	Worked in a day care	3 years	
			Worked with handicapped	2 years	
D	Aide	Grade 12 some courses from University	Worked with Dependent Handicapped Some experience with T.M.H.	3 years	

APPENDIX E
Program Characteristics

Program No.	Number Teachers	Number Aides	Number Students	Ratio
A	1	3	11	1/2.8
B	1	3	9	1/2.2
C	1	2	5	1/1.7
D	1	3	9	1/2.2